Connected by conquest: East and Southeast Asia commercial integration during the Age of Empires.

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PUBLISHED AND PRESENTED MATERIALS.

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Part of Chapter 1 and Appendix A have been presented for publication at the European Review of Economic History as an appendix to the article "Natural Trading Partners? Power and historical Networks in East and Southeast Asian integration (1840-1938)".

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1 . INTRODUCTION

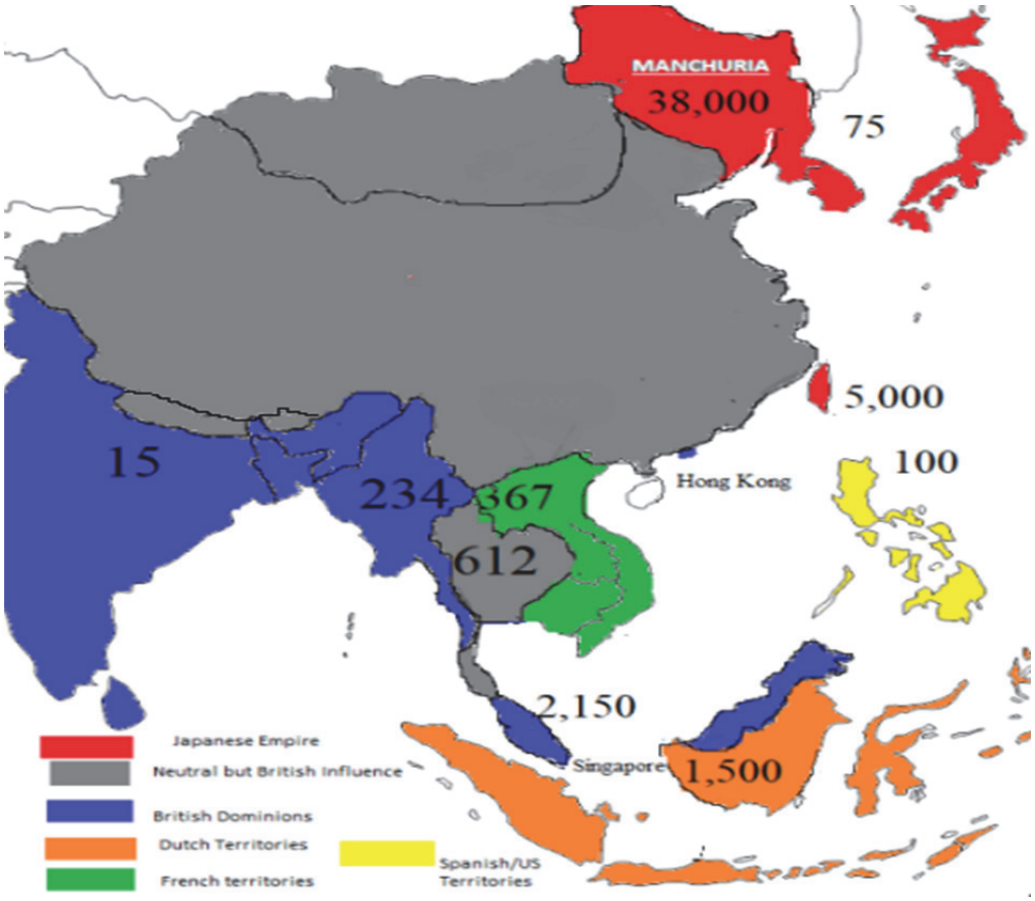
Globalization is a process that across history has been driven by rich countries, which were generally reaping benefits from poorer territories. Nonetheless, this tendency has been reverted during recent decades during which peripheral regions have become prominent traders, spurring the latest wave of commercial liberalizations. These trends have given rise to a literature that studies the evolution of the commercial expansion experienced by peripheral countries, as well as their recent integration into the global economy. These works survey, among other things, the prospect of a deepening of regional integration through the establishment of Customs or Monetary Unions in the analyzed territories. Among their most relevant findings, they highlight East and Southeast Asia as one of the most regionally integrated peripheral territories, and infer that the high level of intra-regional trade shown by member States has its roots in events preceding the establishment of Free Trade Areas between them. All these signals point in the same direction: the potential historical origins of East and Southeast Asian regional integration. Effectively, this is the main motivation of the present work, which, in order to be demonstrative, should cover the longest possible time span before the era of multilateralism began after World War II.

During the present work, East and Southeast Asia will be considered as a regional entity composed of countries depicted in maps 1 and 2; that is, by the sub-regions of East, Southeast and South Asia. The inclusion of this last set of territories is controversial, bearing in mind that another close territory like Australia is excluded from the analysis. Nevertheless, this decision makes the most sense given that South Asia shares a tradition of trade and migration with East and Southeast Asian territories in which Australia was not a participant. Across history, this region created wealthy commercial networks that were exploited by local merchants. This led, for example, to an Age of Commerce between the 15th and 17th Centuries, in which commodity trade integrated the entire region. Regrettably, the following thesis doesn't capture those exchanges as it attempts to investigate trade at the country-level, creating consistent political units, and the first evidence of trade returns for complete country-level only dates back to 1840.

Fortunately, the reconstructed database captures the rapid commercial expansion experienced once the region started to trade in manufacturing products around the second half of the 19th century, which can be considered the starting point of contemporary regional integration in East and Southeast Asia. This was only possible thanks to the expansion of the Industrial Revolution brought by Imperial Powers that conquered the

region during the period baptized as the Age of Empires, and reflected in map 1, which shows that the British dominated South and Southeast Asia, while Japan controlled the Eastern part of the region. The first consequence of foreign occupation was the diversion of trade outside the region and increased integration with the colonial metropolis and foreign territories under the yoke of a common conqueror. However, after 1860, transit networks that were created by the British Empire to facilitate access to China by European merchants started to be abandoned by Western ships and to be exploited by a group of local traders, driving a veritable explosion of commercial exchange between neighboring countries. These local networks were fueled by reductions in transaction costs and infrastructure investments undertaken by empires across the region as well as by the Chinese diaspora reflected by the map, which was particularly intense in the Southeast and in Eastern lands like Manchuria or Taiwan.

Map 1: Empires dominating East and Southeast Asia and nº of ethnic Chinese (thousands) in each country by 1938.



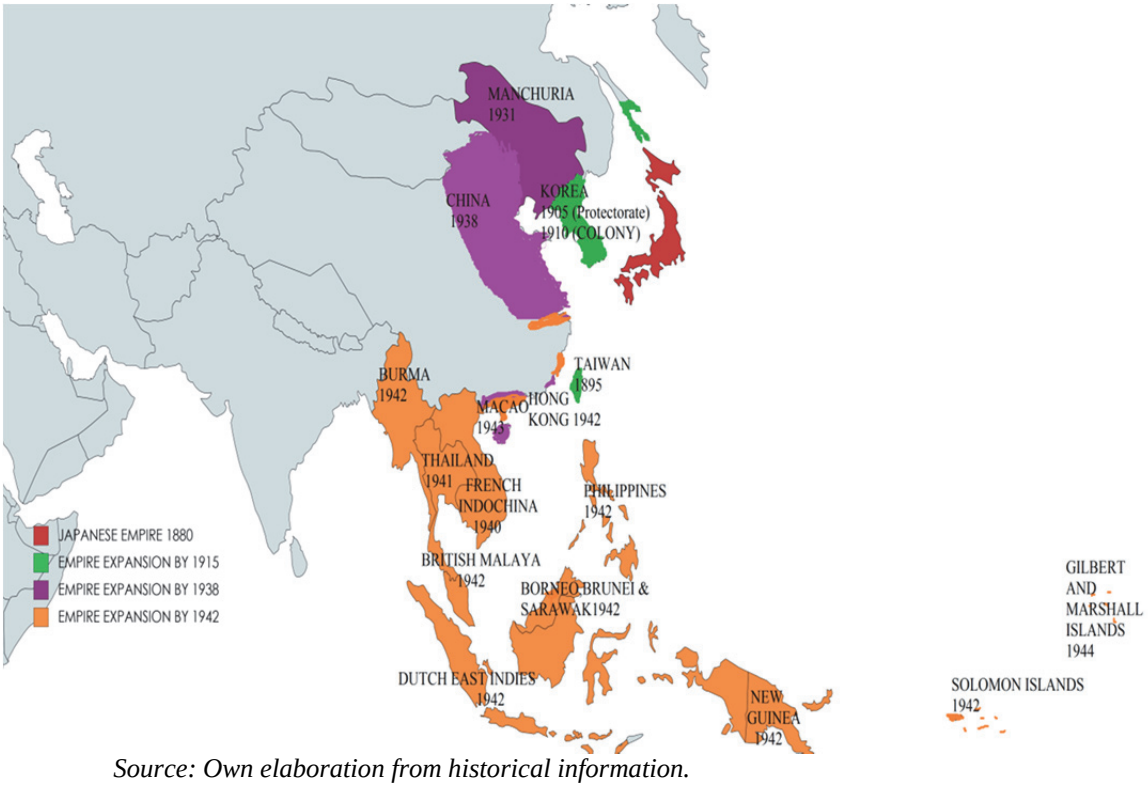
Source: Own elaboration from historical information. Nº of Ethnic Chinese from Purcell (1966).

This regional integration was then consolidated during the interwar years by the emergence of the Japanese Empire that employed conquered territories as a market for

testing its new manufacturing exports. Our results show that the policies of this empire were the principal force driving East and Southeast Asian regional integration during the Age of Empires. The first set of territories, colored in green and purple respectively on map 2, were formally colonized by Japan, while the land in orange was conquered during WWII but informal links had been established long before.

Many authors believe that the extraordinary influence exercised by this particular empire was possible thanks to Japan's peculiar developmental character, although in the following thesis we argue that Japanese colonial policies responded to the hidden interests of business and military elites in a similar vein as other European Empires. Alternatively, this work defends that the main contribution of the Japanese Empire to the process of commercial integration was the employment of Asian colonies and informal imperial mechanisms for sustaining its growing industrialization. A residual of this action was the establishment of an intra-regional specialization in which raw materials were imported from regional neighbors in exchange for manufacturing exports, a pattern that has been subsequently repeated during every industrialization process, maintaining high levels of intra-regional trade in East and Southeast Asia. Such a virtuous circle was only attained through the symbiosis between business and civil and military elites whose interests were aligned by mutual profit-making.

Map 2: Japanese Conquests during imperial period (1880-1945)



Source: Own elaboration from historical information.

This story is summarized in two parts. On the one hand, chapters 1 and 2 offer a long-term overview of regional integration in East and Southeast Asia. The former confirms that the levels of intra-regional trade were remarkable long before the establishment of FTAs by performing a comparison with levels found in Western Europe and Latin America. For a more precise understanding of the evolution of East and Southeast Asian trade, we have reconstructed bilateral imports of 13 countries in the region over the long-run (1840-1938). The novelty of the constructed database is that the data is mainly culled from information collected by Asian or colonial customs, is constructed for a unique research purpose, and follows single construction criteria for the first time. Throughout the chapter, we review the main sources of information and transformations performed on the database to fit it to our research purposes. These include the subtraction of bullion and specie imports, the estimation of the regional origin of transit trade, and the construction of consistent political units.

In addition, it is shown that for most of the period, this new database outperforms existing ones with respect to the number of trade flows or total imports presented, although is worth noting the superiority of the Ricardo database in certain countries and periods. For this reason, the analysis of regional integration in East and Southeast Asia is performed on a mixed database that contains the best information from both sources. To demonstrate the superiority of Asian integration with respect to European and South American, we use a Gravity Model in which a positive coefficient of the regional dummy shows an intra-regional trade effect that is superior to what GDP and trade costs might indicate in principle. This is the case of East and Southeast Asia whose coefficient is double that of Western Europe, but not the case of Latin America, which did not show significant regional bias at that time.

The second chapter conceptualizes the special trade intensity found in East and Southeast Asia and disentangles its main determinants. To achieve this aim, it revives the concept of Natural Trading Partners, according to which the establishment of Customs Unions between them would be welfare enhancing. The paper defines three criteria that neighboring territories should meet in order to be considered Natural Trading Partners, and employs the previously described imports database and a Gravity Model similar to the one presented previously in order to confirm that the studied countries met all such criteria. We then estimate a regression in which we try to check whether the special Asian integration at that time was better explained by economic forces, as the literature points to in the case of

Western Europe, or if historical phenomena like imperial conquest or the exploitation of local trading networks were more influential.

One of the main conclusions from chapter 2 is that imperial activity was the main decisive factor behind East and Southeast Asian regional integration in the late-19th and early-20th centuries. Amongst their many contributions, empires shaped an intra-regional specialization that was subsequently repeated whenever a member country experienced an industrialization process, and which has permitted the region to maintain high standards of regional trade interactions until nowadays. The Japanese Empire was the first territory benefiting from this process and for that reason, the second part of the thesis (chapters 3 and 4) focus in Japan's industrialization and how it fostered regional integration during the interwar years. The former one reconstructs Japan's margins of industrial exports to descriptively and empirically demonstrate that occupation of Taiwan, Korea and Manchuria permitted Japan to easily allocate high skills manufactures to those territories. Japanese formal empire also permitted the incorporation of new sectors to exports' markets, thus completing its industrialization at the same time as it contributed to raising regional trade. Apart from that, we also discover that Japanese military occupation was preceded by the economic penetration of economic actors that also facilitated regional exports. In other words, chapter 3 demonstrates that Japan's shadow of power permitted an expansion of industrial exports inversely related to productivity.

The main example of the efficacy of those informal empire connections and how they anticipate military conquest is Manchuria, which can be used as a case study on the influence exercised by certain Japanese elites over colonial policies. For that reason, the last chapter uncovers the existence of cooperation between those businesses that were installed in Manchuria during colonization and Japanese imperial authorities. The objective is to see whether the colonization of Manchuria by Japanese businesses fits any model of Business or State Capture. For that purpose, we collect information on the foundation acts, profits and investments of the main Japanese companies operating in Manchuria during colonization (1907-1945) in order to theorize that there was a constant exchange of favors between them and civil and military authorities that proved to be mutually beneficial. Besides this, we use the capture of the South Manchurian Railway (SMR) Company by the Kwantung Army during the 1930s in order to demonstrate that military interests prevailed during the last stage of the Japanese Empire, burying any glimpse of developmentalism inherent in Japanese imperial intentions. This is demonstrated by the application of a Diff-

in-Diff Model in which the transport freights established by SMR on behalf of the military were associated with a relevant increment of chemicals and metals production and of machinery exports, sectors that were dominated by Nissan, which transferred to Manchuria, coined as MHID thanks to its personal links with the military.

In sum, this thesis argues that the extraordinary levels of regional intensity shown by the evolution of trade in East and Southeast Asian countries originated during the Age of Empires (second half of the 19th century) thanks to the exploitation of British transit networks by local merchants. They were consolidated during the interwar years thanks to Japanese Imperial expansion, which was employed to support its incipient industrialization. This experience sparked a process of intra-regional specialization in which every territory inside the region was able to obtain raw materials and to export manufactures to its neighbors, maintaining high levels of regional trade until today. In the end, this process only succeeded thanks to the intense and mutually beneficial cooperation established between business and political elites operating in different territories.

2 . CHAPTER 1: THE COMPARATIVE HISTORICAL REGIONAL INTEGRATION OF EAST AND SOUTHEAST ASIA (1840-1938). A RECONSTRUCTION

2.1. Introduction.

After more than a century of Western dominion of multilateral trade liberalization, the end of the Cold War permitted an increasing participation of developing countries in this process. This growing global integration by peripheral countries has been accompanied by free trade agreements between regional neighbors, starting a process known as open regionalism. In fact, this new tendency has motivated a vast literature aiming to disentangle the main characteristics of commercial relationships established by those territories and their principal determinants (Pizarro, 1999). Among the most important findings found on these works we can glimpse a contrast between integration processes experienced in different regions like East Asia and South America. While the former presents higher levels of regional integration, which were remarkable long before the establishment of free trade agreements, Latin America provides a lower degree of intra-regional trade that only emerged after the signature of commercial agreements. In brief, this literature suggests that historical developments have a great influence over the different extents of regionalization presented by peripheral regions and this motivates us to comparatively analyze the levels of regional trade in East and Southeast Asia across history.

Similar studies have found surprisingly high levels of regional trade between Asian partners, comparable to those of Western Europe and far superior to those of other underdeveloped areas in Africa or the Americas before WWII (Aminian et al., 2009). Those results challenge economic theory since they depict a relatively poor and scattered region whose levels of intra-regional trade were among the highest in the world and that's why they are going to be checked through a Gravity Model in the present paper. In the end, the idea is to compare coefficients obtained in this model for East and Southeast Asian regional trade with the ones found under similar circumstances for the same period in Western Europe or South America.

For that purpose we need to reconstruct the long run bilateral trade flows disaggregated by country of origin provided by East and Southeast Asian countries before the Second World War. Nevertheless there is a marked absence of such data since most studies focus on the high colonial period (1870-1914) and neither covers the previous

decades nor the interwar years, while others just focus on particular cases and forget about the overall behavior of the region. [1]The most notable exceptions are the works by Sugihara which reconstruct East and Southeast Asia bilateral trade between 1800 and 1938 using local official sources (Sugihara 1985; 1998 and 2013). Nevertheless, data compilation didn't respond to a single purpose but solved different research needs (all of them related with determining the degree of intra-Asia trade by the way) and that's why it doesn't cover all the years or reporting countries necessary for a comprehensive analysis. For example they have trade data for Bengal, Bombay, Singapore, Canton, Hong Kong, Java and Madura during 1811 and 1840, and obtained annual data for all the countries covered on the present article with the exception of Sri Lanka and Philippines between 1913 and 1938.

Those gaps on the compilation of trade statistics provoked that the only way to access to comprehensive long term bilateral trade data for East and Southeast Asia on an annual basis and following unified criteria was to look at public international trade databases like Ricardo. They were however not specifically focused on the region so the sources employed were more limited and lacked information for some territories and periods (Dedinger & Girard, 2017). This paper presents a new database that solves these problems using mainly secondary sources collected from local customs on a similar way as Sugihara and adapted to econometric analysis after transforming original data.

In other words, the confection of the following database is intended to fill a gap in the analysis of East and Southeast Asia trade statistics since it covers 99 years of uninterrupted bilateral imports for 13 countries inside the region, attending to a single research purpose and following coherent unique criteria. Those features represent the main strength of the database which along the paper demonstrates its historical reliability and high quality since it proofs to offer more flows and bigger total imports than other relevant trade databases for most of the period. Furthermore, the way we organize it by constructing stable political units makes it perfectly suitable for every kind of analysis regarding imports determinants and regional composition of East and Southeast Asia trade.

All in all, the present paper aims to historically compare the degree of regional integration experienced by East and Southeast Asia territories and countries in Latin America and Western Europe long before the establishment of free trade agreements. First

[1] Kobayashi (2019) only includes data from Singapore until 1913, Michiro et al. (2018) only cover India between 1905 and 1911, Shimpo (2011) focuses its attention on China and Japan during the interwar years or Kobayashi & Sugihara (2020) that in this case cover more than a Century of exports but only of Sarawak.

of all, we are going to review the different sources from which imports data have been collected as well as the main features of the data sources employed. On part three, we are going to mention the different adjustments made to original data in order to better cover our research needs. For an evaluation of the degree of reliability of our database, the fourth part of this article will compare it with other already published ones on the basis of total flows presented and the amount of total imports reported by our 13 Asian countries at every period. The recognition of certain limitations in our database will lead us to propose a mixture between our data and Ricardo in part 5, trying to offer a more precise image of East and Southeast Asia trade during the late 19th and early 20th century. Finally, on the last section of the paper and by means of a Gravity Model, we are going to check our main hypothesis regarding the superior degree of regionalization inside East and Southeast Asia compared with Western Europe and South America countries.

2.2. East and Southeast Asia reporting countries and trade sources consulted.

2.2.1. East and Southeast Asia definition.

The main research purpose of the following database is to disentangle the levels of regional integration in East and Southeast Asia countries at different periods before WWII, analyze its main determinants and compare those levels with the ones presented by other regions like Europe or the Americas. For that purpose, the first step that must be taken is to provide a definition of the criteria followed in order to define East and Southeast Asia as a region and which countries are eligible to be part of it.

The first condition that defines our region is that it should only be composed by Asian countries, excluding Oceania, which could be considered to be part of East and Southeast Asia if we only attend to commercial purposes. Nevertheless, there are cultural discrepancies that push us to exclude Australia from our study. We consider that many Asian countries have historically shared a cultural identity that has nothing to do with Australian idiosyncrasy inherited from British colonizers. Furthermore, Australia doesn't have racial similarities with East and Southeast Asia inhabitants, especially after the colonization process that meant the settlement of white men and ended up with aboriginal population (Moses, 2000). Lastly, as we'll explain later, Asia has a long tradition of international trade, while Australia only started its commercial activity after the colonization, that's why it is often qualified as a new settler (McLean, 2012).

According to geographic conditions, Asia boundaries are the following ones: the Suez isthmus represents the frontier with Africa, the line that goes between the Aegean Sea, the Dardanelles-Sea of Marmora-Bosporus and the Black Sea, along the watershed of the Greater Caucasus, the northwestern portion of the Caspian Sea and along the Ural River and Ural Mountains is the imaginary frontier with Europe. Finally Asia boundary with Oceania is located somewhere in the Malay Archipelago. All in all, mainland Asia ranges through about 77° of latitude and 195° of longitude (The New Encyclopedia Britannica, 15th ed.; United Nations, 2019)

Nevertheless, the vast territory represented by Asia makes necessary the creation of a deeper division. In that sense, Asia could be divided between the Middle East, Central Asia, East Asia, South Asia and Southeast Asia. In that sense, the region analyzed in the following paper is created through the addition of the last three. Nowadays, the countries of East Asia include China, Japan, North Korea, South Korea, and Mongolia (as well as Hong Kong, Macau, and Taiwan). South Asia is also referred to as the Indian Subcontinent, separated from East Asia by the Himalayan Mountains between China and India and defined largely by the Indian Tectonic Plate on which its countries largely rest. South Asian countries include Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Lastly, the Southeast Asian region defines the tropical and equatorial countries between South and East Asia to the North and Oceania to the South. The countries of Southeast Asia include Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar (or Burma), the Philippines, Singapore, Thailand, East Timor (or Timor-Leste), and Vietnam (World Atlas, 2019).

All in all, attending to the previously mentioned conditions, our East and Southeast Asia region will be composed by Asiatic countries, that are not landlocked but has access to the see, located between 40 North and 10 South Parallels and 80 and 140 East Meridian and which have more than 50,000 inhabitants, thus excluding some islands on the pacific. This brings us a region composed by the following 13 countries to which we've found trade information for more than one year: Japan, Indonesia, India, Philippines, Sri Lanka, French Indochina, China, Siam, Korea, Taiwan, Myanmar, British Malaya and British Borneo

2.2.2. Data sources

Most of the data is obtained from secondary sources either obtained on online libraries, microform or physical volumes. Among the sources employed some of them correspond to British or French colonial reports, but the majority are official statistics

published by specific countries' maritime customs, something which could portray a significant advantage with respect to international public databases consulted. Starting with East Asian countries, Japanese imports by country of origin between 1870-1879 are obtained from Barbieri et al. (2016). We also employ Statistical Abstract For The Principal And Other Foreign Countries (various annual volumes from 1880 to 1899). Then data for 1900-1938 comes from Annual Returns of the foreign trade of Japan (various volumes), to which we add imports from Korea and Taiwan that don't appear on the official sources since they are considered imperial imports. Taiwan exports to Japan, as well as its imports by trade partner are found on Returns of the Trade of Taiwan for Forty Years (1896-1935) and Annual return of trade of Taiwan (Formosa) (1936-1942). Both Japanese and Taiwanese reports were published by their corresponding Ministry of Finance. Korean exports to Japan and imports by trade partner are obtained from Ricardo (1882-1889 and 1900-1918) and on Long Term Economic Statistics for Japan estimated by Ohkawa et al. (1967-1989) for the years 1919-1938. Chinese imports are obtained from Commercial Reports from H.M Consuls in China (1864-1869), Statistical Abstract For The Principal And Other Foreign Countries (1870-1906), Report on the trade of China and abstract of Statistics. Foreign Trade of China (1908-1938).

For the case of British colonies we start from Indian imports which are obtained from Statistical Abstract for British India (1840-1938) and Statistical Abstract for the Several Colonial Possessions of the United Kingdom (1877-1891). Imports of its neighbor Sri Lanka come from different sources like An Outline of the Commercial Statistics of Ceylon 1840, Reports On The Finance And Commerce Of The Island Of Ceylon 1847, Statistical tables relating to the colonial and other possessions of the United Kingdom (1854-1866), Statistical Abstract for the several Colonial and Other Possessions of the United Kingdom (1870-1891), Statistical Abstract for the several British Colonies, Possessions and Protectorates (1892-1906), Statistical Abstract for the several British Overseas Dominions and Protectorates (1909-1923) and Statistical Abstract for the British Empire (1925-1938). The last four sources are also employed for obtaining imports from British Malaysia, British Borneo or Hong Kong.

In addition, imports from Indonesia are obtained from Korthals Altes, (1991), from the Philippines data comes from Census of the Philippine Islands (1954) and Annual Report of the Bureau of Customs (various years, data summarized and visible at http://www.ier.hit-u.ac.jp/COE/Japanese/discussionpapers/DP97.28/table3.htm), while data

from Siam comes from Commercial Reports of H.M Consuls in Siam (1864-1895), Statistical abstract of foreign countries. Part I-III. Statistics of foreign commerce. October, 1909 (1896-1909), the Foreign Trade and Navigation of the Port of Bangkok (1910-1927) and Statistical Yearbook Thailand (1928-1938).[2] Finally, French Indochina imports are found on Annuarie Statistique de la France (1882-1930) and Annuarie Statistique de L' Indochine (1931-1938). Lastly, Myanmar and Borneo imports data is obtained from Ricardo database (available online at http://ricardo.medialab.sciences-po.fr), which will be also employed to fill periods for which our sources don't contain information as it will be analyzed lately.

2.3. Adjustments performed to original data sources.

According to historiography, the consulted trade statistics were collected mainly attending to tax and purposes and for that reason its application to econometric research requires some readjustments on the data. The first decision that has been adopted when managing original data sources is which criteria we should adopt for establishing political units. In that sense, Ricardo database has solved the problem by reflecting literally the territorial division performed by each consulted data source and specifying whether the corresponding political unit is a country, a city/port part of a country, a colonial area, a geographical area or a group of countries. This solution is not useful for our research objectives because we needed consistent political units from which we can obtain economic information like GDP. For that reason, we decided to group the territories offered by original data sources into countries following 1913 frontiers and adding also those new states created after WWI, on a similar way as done by Federico & Tena (2019).

First of all, this unification criterion has been followed to construct reporting political units. For example we have decided to group the territories corresponding to The Straits Settlements (Singapore, Penang and Malacca) and the Federated (we only found data for 1905 in Ricardo and 1909-1914 on British reports) and Unfederated Malay States (no data has been found for this territory) under British Malaya. British Borneo, which was a different political until it joined Malaysia in the 1960s, is composed by Sabah, Sarawak, Brunei and the Labuan Island. Lastly, territories of what it is today Thailand will receive

[2] Until 1928 it only includes data from the Port of Bangkok, the major port in Siam. After that it also includes data of imports on the whole Siam, although we keep the same nomenclature for guaranteeing the stability of the political units.

the name of Siam, which was the official one during the interwar years (even though until 1928 information obtained just corresponds to imports from the Port of Bangkok).

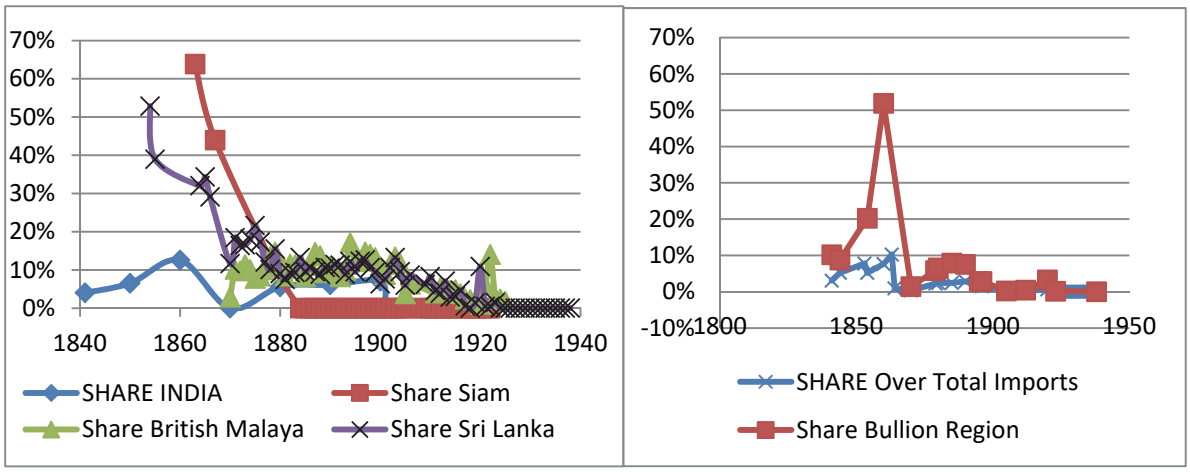
Secondly, we have followed the same criteria for building partner political units since we have grouped imports from cities or ports into single countries. Those unifications are performed by summing up imports from every major independent territory composing a political unit. For example we have added imports coming from Java and Madura in order to form Indonesia or sum imports from Cape Colony and Natal in order to obtain imports coming from South Africa. In addition, original data sources many times include information for unspecified territories that can't be associated to any particular political unit (i.e. Africa N.S, British Colonies, Other Territories…etc.) and for that reason they are eliminated from our database, although others like Ricardo keep this information. All in all, those different standards employed for constructing political units might affect the number of flows presented by our database in comparison with others as it will be analyzed throughout the paper.

In addition, the analysis of commercial integration and its economic determinants requires some adjustments that might disturb total imports. Among them, one of the most relevant has consisted on subtracting bullion and specie imports from those sources that explicitly accounted them, which were British India, Siam, British Malaya and Sri Lanka. Those treasury imports are believed to distort the image of a country's trade because they don't offer any productive information and that's why they are eliminated from our database. Their relevance was especially important on early years (1840-1880), although after that their share became very low as we can appreciate on the left hand side of figure 2.1. In that sense, we can see that Siam and Sri Lanka imports were the most affected by this adjustment, since bullion and specie imports represented more than half of their totals during the second half of the 1880s.

The right part of the figure assesses the overall impact of subtracting treasury imports. We can see that including those figures would overestimate total imports from our 13 countries by a maximum of 10% during 1860s. The bias amount is bigger if we just study regional imports since bullion and specie represented a 50% of total regional imports on the very same year. The totality of this bullion was imported by India and seems to be related with exchanges of Opium by Silver vis a vis China (Feige & Miron 2008; Deming 2011). This intuition is partially confirmed by our data which shows that during 1864-1866 most regional treasury imports performed by India had their origin on China.

Moreover, the share of this merchandise was reduced substantially once Opium trade started to vanish as we can see on figure 2.1 where treasury imports never exceeded 10% of regional imports after 1860, presenting an average of 3% until 1938.

Figure 2.1: Share of bullion and specie over total India, Siam, Malaysia and Sri Lanka imports (left) and share over total and regional imports for our 13 countries (right) 1840-1938.



Sources: See text.

The procedure employed for subtracting bullion and specie imports was straightforward for Siam which offered a detailed disaggregation of treasury imports by country of origin, so we just subtracted this quantity from the corresponding partner's flows. The same process has been repeated for Sri Lanka on the years 1854-56 and India (1864-66). On the other hand, sources for British Malaysia (1880-1923), Sri Lanka (1864-1923) and India (1841-1863 and 1871-1901) also include bullion imports but don't specify the country of origin. In that sense, as a second best option, we compute the share of treasury over total imports and subtract the corresponding percentage from every partners' flows (e.g. if bullion represents a 5% of total imports we subtract this 5% to imports from each partner). [3] This method is far from perfect, but the biases generated by this practice won't be very significant (most of the time smaller than 10% of imports coming from every country), while the inclusion of treasury would distort our analysis of merchandise exchanges in the region.

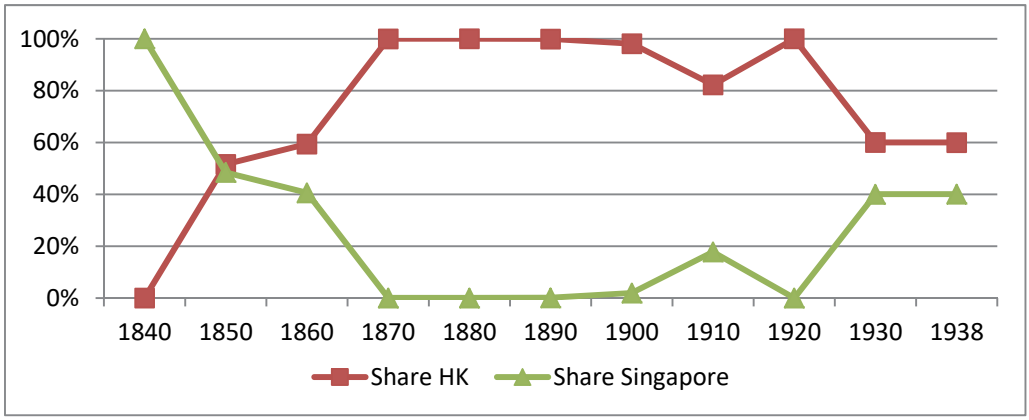
[3] Indonesia (1822-1873) and Philippines (1855-1885) imports include bullion but official sources don't permit us to isolate it, so we can't eliminate it from total imports.

Finally, a detailed analysis of commercial integration inside a certain region requires a precise determination of the origin of traded merchandise. In this regard, the treatment of transit trade passing through Hong Kong and Singapore requires a transformation because most trade flows passing through those two ports were assumed by the literature to be transit (Dennys, 1867,pp 51). In other words, most imports coming from Singapore or Hong Kong weren't produced there, but had their origin somewhere else. That's why accounting for those flows as Southeast Asian imports would overestimate regional share on our analysis.

First of all, we assume the limitations of the approach followed by this research, but we are fairly convinced that the adjustments performed really add value to the database because our assumptions are more realistic than simply accounting for transit trade as it was fully regional. Of course this division will artificially increment the number of flows included on our database since imports from Hong Kong and Singapore will be divided into Regional, Europe/Africa, Americas and Oceania transit, but for comparative purposes we will only account for them as if they compose a single import flow. In addition, this estimation permits us to capture a historical phenomenon as it was the employment of transit networks for expanding regional trade on the last quarter of the 19th century, something that, as the cited article shows, was key for explaining extraordinary levels of trade integration presented by the region.

In any case, the process for reconstructing the origin of transit trade flows has overcome certain difficulties. The first one is the scarcity of trade data for Hong Kong during the 19th century, which at least is not shared by Singapore. There was a possibility of estimating transit by only using Singapore flows but we would be losing an important part of the story, probably the most important one if we attend to historiography and information obtained on figure 2.2 where we can see that after 1870 most transit trade came from Hong Kong.

Figure 2.2: Share of Hong Kong and Singapore over total Transit imports destined to East and Southeast Asia. (1840-1938)



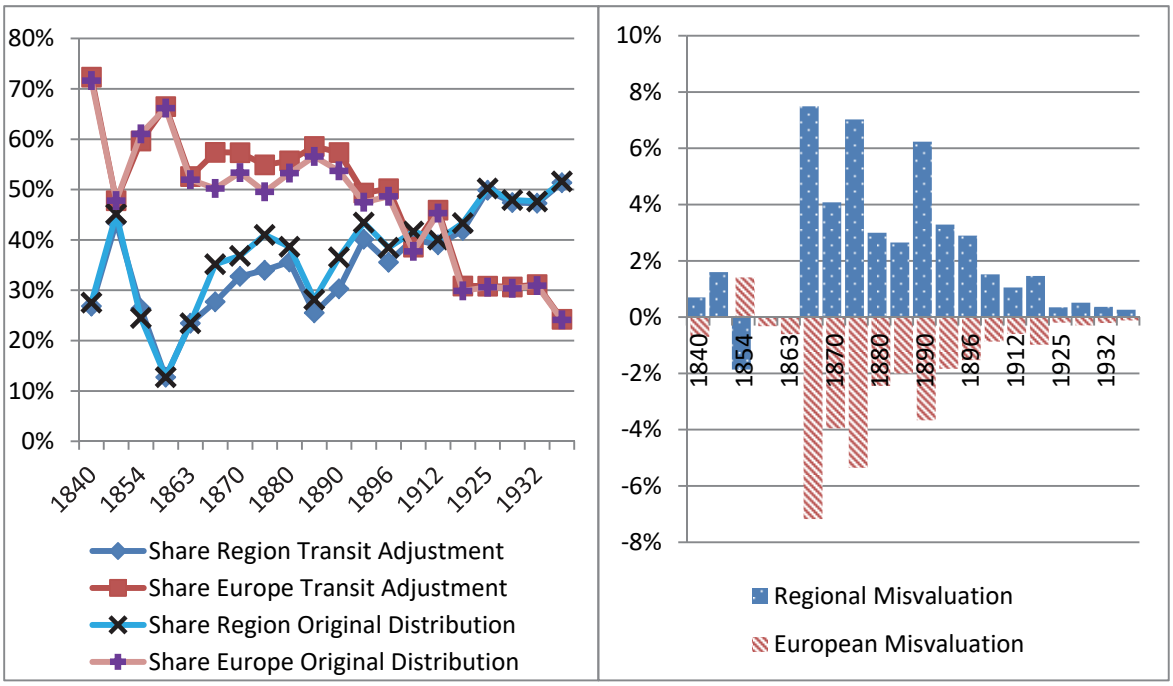
Sources: see text

For that reason it was necessary to reconstruct Hong Kong imports in order to determine their origin and it has been done by obtaining from Ricardo database information about exports by each world partner towards Hong Kong. For consistency purposes we will also employ mirror flows as a technique for the reconstruction of Singapore imports by country of origin.

Thanks to this information we can calculate the share of each region over Hong Kong and Singapore imports. Then we assume that Hong Kong and Singapore production is exhausted by internal consumption so that whatever is imported by those territories is then re-exported. If these assumptions hold true, then we could expect that the regional distribution on entrepôts' imports is then maintained for its exports. In other words, if 70% of what Hong Kong and Singapore imported came from East and Southeast Asia region, then a 70% of everything they export to each partner is going to have its real origin in East and Southeast Asia.

Regarding possible biases arising when this adjustment is not performed we could see in figure 2.3 that following the distribution found on the original source would overestimate regional share over total imports and underestimate Europe's one. The size of this bias was more relevant during 1864-1895 and supposed a misevaluation of almost 8% on the shares.

Figure 2.3:Regional and European Share over total Asian imports under new and conventional transit treatment (left) and % misvaluation on Regional and European shares by the original data source distribution (right) 1840-1938.



Sources: See text.

2.4. Examining data reliability: Comparison with published trade databases.

After presenting the main particularities of this new database and modifications practiced for adapting it to economic analysis it is necessary to demonstrate its historical and economic validity and this will be done through a comparison with already existing databases that contain bilateral imports in East and Southeast Asia region. The most usual way of measuring reliability of a trade database is to compare total quantities presented by them, although it is not the most precise one. In that sense, we believe that an analysis of the number of flows, attending to the number of reporting countries, years available and number of partners is the most accurate assessment. This is reflected on table 2.1 where we compare our Asia database (**A&T**) with the Asian data extracted from (Dedinger & Girard, 2017) which will be named **Ricardo**, (Barbieri & Keshk, 2016) known as **Barbieri** in the following article and the one published by (Fouqin and Hugot, 2016) denominated **Fo-Hu.**

Table 2.1: Main features of A&T, Ricardo, Fo-Hu and Barbieri East and Southeast Asia databases (1840-1938).

Database	Reporting partners	Total Observations	Total Years	Observations per year
A&T	13	13,834	775	17.85
RICARDO	13	13,390	538	24.89
BARBIERI	4	2,125	187	11.36
FO-HU	13	12,322	1004	12.27

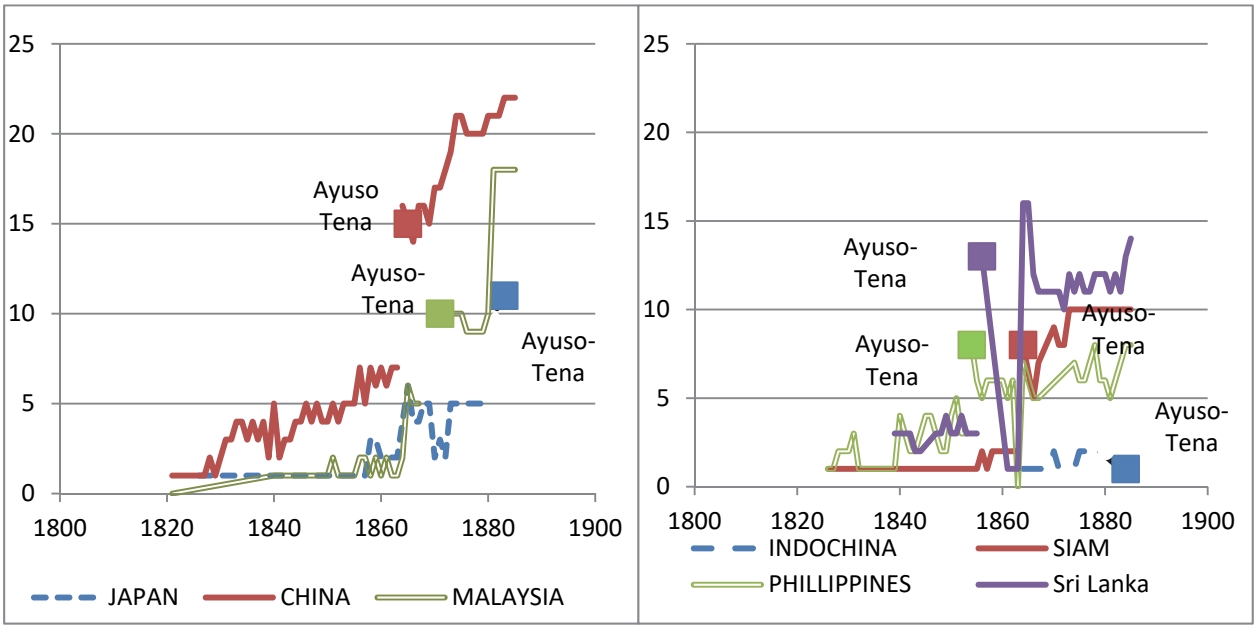
What we can appreciate on first sight, is that every data source presents the same 13 East and Southeast Asia reporting countries with the exception of Barbieri which only presents data for China, Japan, Korea and Thailand before 1938, lagging behind the rest of databases in every aspect. Regarding number of observations, which is a widespread measure of database quality we can see that our database presents the biggest number of flows. In spite of this superiority, A&T database ranks second in number of years available only behind Fo-Hu and also ranks second in observations per year only behind Ricardo. The reason why Fo-Hu presents more years available for these thirteen countries is that their bilateral flows are constructed through mirrors, so they obtain imports data by looking at western countries' bilateral exports, specially for early years. This leads them to present many periods in which Asian countries only report trade with one partner. For our research we wanted to avoid this and capture regional trade intensity so imports have mostly been taken from data sources specific to each territory and as a general rule each reporting country reports more than two partners for every year.

This drawback on Fo-Hu database compared to ours can be appreciated on figure 2.4 in which the number of partners for some Asian importers are depicted combining the two data sources. The colored squares represent the moment in which our database starts to present information for each corresponding partner. For that reason, the line left to the squares represents information from FO-HU while that right to the squares corresponds to information obtained from our database. We can see that the FO-HU has more ancient information but the incorporation of our data brings a considerable jump in the number of partners per reporting country, represented by the discontinuity appreciated at each line. The only exception is Indochina and we can also appreciate that their database always presents less than five flows per importer at those years, while ours is always above this

figure, reaching more than 20 partners for China in the 1880s. Besides, if we eliminate those Asian imports collected by Fo-Hu from rich countries' sources sand just keep import flows coming from international data sources (i.e. Ricardo, Mitchell, Jacks etc. that cover imports for many different reporting countries) and from East and Southeast Asia countries' own reports, we find that total flows in Fo-Hu decrease until 9420, meaning that mirrors from rich countries' specific sources represent almost a 25% of total East and Southeast Asia flows presented by this database.

Those confection discrepancies with Barbieri and Fo-Hu hinder comparability with our database and for that reason we will contrast it with Ricardo. First of all, we can see that Ricardo presents more partners per year than our database. At first sight we can think that it is because of the previously explained unification procedure but a deeper comparison between A&T and Ricardo flows per reporting country will demonstrate that there are further discrepancies. That's why in order to better check those differences we are going to adjust Ricardo information to the same unification criteria as the one employed by us.

Figure 2.4: Number of partners presented by East and Southeast Asia countries under Fouquin & Hugot and A&T databases (1820-1885).



Source: See text.

Table 2.2: Average Number of reporting countries, partners and partners per reporting by decade A&T vs. Ricardo (1840-1938).

	Reporting		Total Partners		Partner per Reporting		Partners per common Reporting		
Period	A&T	Ricardo	A&T	Ricardo grouped	A&T	Ricardo grouped	A&T	Ricardo as reported	Ricardo grouped
1840-1850	2	1	26	19	12	19	22	21	16
1850-1860	3	2	38	27	13	18	19	19	16
1860-1870	5	4	48	31	10	8	13	13	10
1870-1880	7	5	81	69	12	15	18	18	15
1880-1890	9	6	103	86	12	14	19	19	16
1890-1900	9	6	139	108	15	19	24	23	20
1900-1910	12	9	221	185	19	21	27	26	23
1910-1920	11	9	235	194	21	22	28	28	24
1920-1930	10	7	247	175	24	27	29	34	30
1930-1938	10	9	273	269	26	30	32	36	33

Source: See text.

We can appreciate that for every decade we have data for more reporting Asian countries than Ricardo and for that reason our database presents more flows for almost every decade (1880s and 1930s are the only exception). This table also reflects what has been deducted on the previous table, which is that for every reporting country Ricardo has more flows at every decade except 1860s even after grouping flows under the same conditions as our database. Nevertheless, these results are part of a statistical illusion as can be reflected on the last three columns of table 2.2. The main reason why our database presents less partners per reporting country is that we have some reporting countries with few partners which are absent at Ricardo. Of course, those additional reporting countries bring down our average partners per reporting country. That's why the last column includes the number of flows offered only by reporting East and Southeast Asia countries that are common to the two databases. We can see that both databases present almost the same number of flows for every common reporting country until 1920, being our database superior if we apply to Ricardo our grouping strategy. For the last decades however, Ricardo database clearly offers more partners per importer than we do, although most of this difference is due to aggregation matters since after the application of our unification criteria, Ricardo only presents on average one more flow per importer than us.

A more exhaustive analysis will show that countries and periods in which Ricardo presents clearly more flows are **India 1919-1936** (an average of 44 partners more than us)

and **Indonesia (1928-1938),** when they have an average of 31 partners more than us. This compensates the higher partners we have for Japan (26 on average between 1914-1938) while for the rest of countries we generally present more flows, although there are no significant differences. Those differences in flows per reporting partner in India have their origin in 1912 when they employ a database which includes much more partners than us, although they are generally small territories like Algeria, Argentina, Dutch Borneo, Eritrea, British Somalia or Fiji whose share over Indian imports is not very relevant. In addition, the source employed by us for reporting Indonesia imports is much less comprehensive than the one employed by Ricardo and that's why we present much fewer flows after 1928. However, we decided to maintain our original source for coherence reasons since it brings data since the 1840s including the same partners, while Ricardo source starts in 1902.

This would lead us to a first conclusion of this section, which is that our database for Asia includes more reporting countries than Ricardo at every decade and coherent information for more years, making our data more useful for long term analysis. After applying our reunification criteria to Ricardo, our database seems to be slightly more complete for 1840-1920 since we present more flows for every active importer. Nevertheless, it is true that Ricardo database is more accurate for analysis regarding interwar years (1920-1938) as they present more flows per partner, although most of those differences are explained by aggregation maters.

As explained on the introduction for this section, many scholars compare trade databases according to total quantities presented by them. In that sense, the superiority shown by our data regarding total flows should be reflected on total imports. The first thing that should be done in order to make both databases comparable is to translate them to a common currency, which is going to be the one employed by Ricardo, Sterling pounds. In the case of our database, data is expressed in current dollars after translating original currencies through exchange rates found on (Federico & Tena, 2019), while the exchanges rates employed by Ricardo come from another source. This might generate a first discrepancy, although we believe the exchange rates employed by us have superior quality.[4]

[4] An exhaustive analysis of discrepancies in total imports generated by the use of different exchange rates is far from the scope of this paper but would be interesting in the future.

Another possible problem lies on the definition of imports since general trade defines them as all goods entering the country, no matter their final destination, whereas special trade only includes goods put at the disposal of importers as well as goods stored in warehouses destined for domestic consumption. Anyway, we believe this technical concern won't affect the comparison since both Ricardo and this database bring priority to special trade flows when both kinds are available. The only difference arises with the treatment of transit trade passing through Hong Kong and Singapore, which has been addressed on previous sections. However this issue will only affect regional distribution of imports, not the totals.

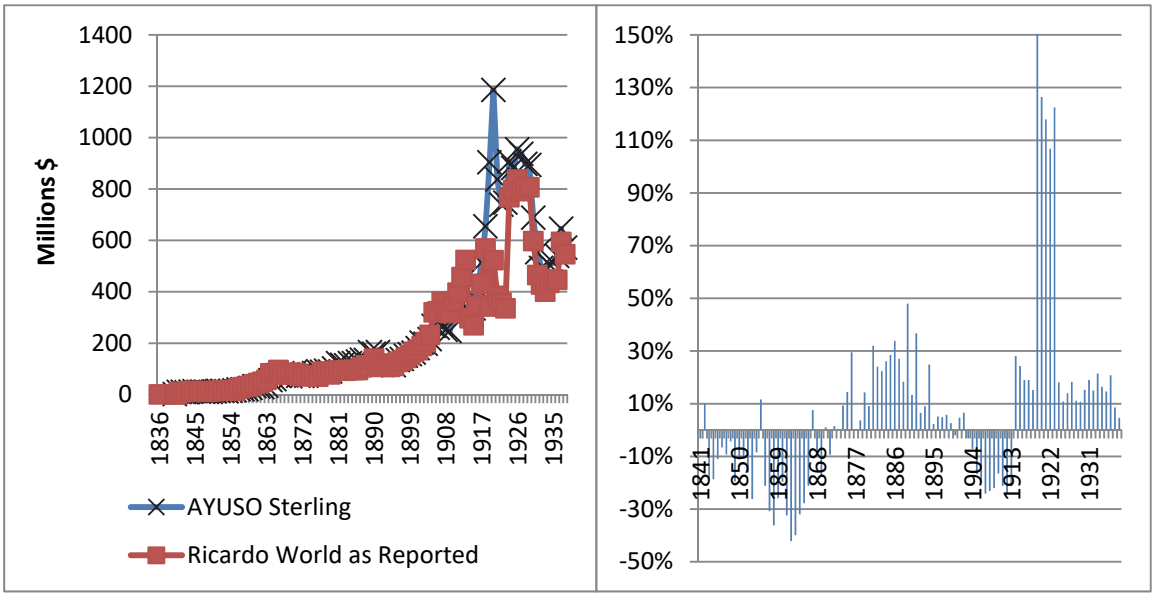
Figure 2.5 depicts total imports presented by our selected Asian countries under our database compared with the totals for those same countries on Ricardo "World as reported". Ricardo database has other ways of computing totals like summing total imports between the reporting countries and all its partners ("World sum of partners") or performing some estimation ("World Bestguess") and although figures differ between those different methods, the tendency is more or less the same for everyone.

After all, we can appreciate how our database offers lower values of East and Southeast Asian total imports between 1840-1866 than Ricardo (World as reported) and substantially higher ones for the rest of the period (with the exception of the early 20th century before WWI in which we present slightly lower values). Discrepancies reach a 30% of our total Asian imports which is a considerable and unexpected figure, taking into account that for this period Ricardo only offers data for India, while we also have imports for Indonesia, Philippines for most periods and sporadic information for Sri Lanka and Siam. Furthermore, the sources employed by Ricardo and us for determining India imports offer similar totals at those decades.

The main reason explaining such low value on our database until 1860 has to do with the series of adjustments explained on section 2 which were destined to eliminate bullion and specie imports from the totals offered by the original data sources for India, Sri Lanka, Siam and also British Malaysia. On figure 2.6 we can see that if we account for the same reporting countries our database presents substantially smaller totals after eliminating bullion and specie but offers slightly higher totals than Ricardo if we add the bullion and specie imports with the exception of some years between 1864-1870 in which official sources don't include India treasury imports.

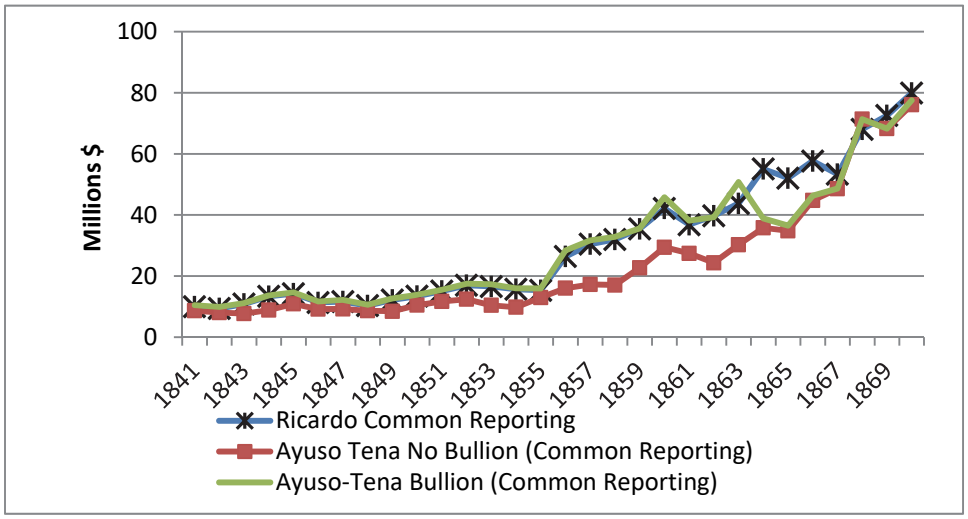
After that, during the 1881-1891 periods our Asia presents bigger totals because we have Siam, Philippines and Indonesia, while they don't and most importantly, because our data source for India provides much bigger imports than the one used by Ricardo at this period (the Annual Statement Of The Seaborne Trade Of British India With The British Empire And Foreign Countries).

Figure 2.5: Total East and Southeast Asian imports under A&T and Ricardo (as Reported) 1840-1938. (left) and discrepancies as % of total A&T imports (right).



Sources: See text.

Figure 2.6: Total East and Southeast Asia Imports A&T with and without and specie and Ricardo using the same reporting countries (1841-1870)



Source: See text

On the other hand, the lower values presented by our Asian database compared with Ricardo before the First World War (1906-1913) are closely related with adjustments

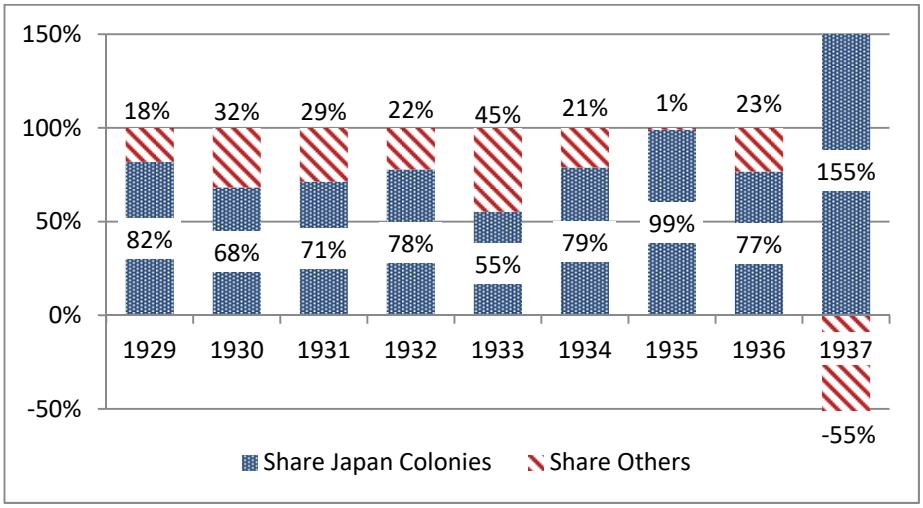
performed to original sources in order to build consistent political units. Those sources, which are employed by Ricardo, account for Federated Malay States imports coming from the Straits Settlements which were substantial. Opposing them, we've created a synthetic British Malaysia by adding imports of its principal ports and territories, so we consider these previously mentioned flows to be intra Malaysia imports, so they are not recorded as external trade. Up to this point, we can say that the quality of both databases is similar in the sense that differences are explained by adjustments made on our databases for our research purposes.

Nevertheless, the period right after WWI (1919-1923) presents major differences between Ricardo and the database presented on this paper. We offer much bigger figures because surprisingly they miss data from Indonesia, French Indochina, Siam, British Malaysia or Sri Lanka and Japan, this last one accounts for the major share of discrepancies since it was the biggest importer in the region at that time. The reason for this missing data is that during the interwar years they prioritized League of Nations information over British statistics and they provide less detailed information. Instead, we prefer to use country specific secondary sources like Japanese, Siamese, French Indochina or Indonesia which are more disaggregated.

Lastly, the bigger totals presented by our database during 1929-1937 are mostly explained by the previously mentioned incorporation to our database of Japanese imports from its colonies of Manchuria, Korea and Taiwan, which weren't included on official statistics nor in Ricardo database. Those exports represented around 55-99% of the total gap between both databases between 1929 and 1936 (an average of 76%), being even bigger than the gap in 1937-38.

All in all, if the quality of databases is exclusively measured according to total imports offered, our Asian imports database would improve Ricardo during 1872-1905 and 1919-1938. Nonetheless, the periods in which we present lower totals (1840-1871 and 1906-1913) correspond to adjustments made on our database aiming at raising its reliability, so we believe the quality of our database is not lower than Ricardo one at any period as we've demonstrated on the previous paragraphs analyzing the number of flows presented by each database.

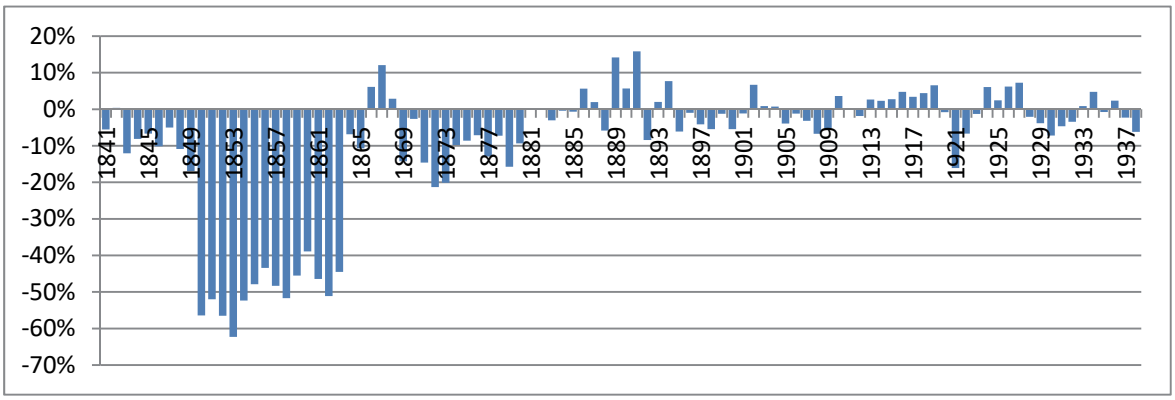
Figure 2.7: Territorial distribution of the excess imports presented by A&T in comparison with Ricardo (1929-1937)



Sources: See text

Finally, if we compare total imports for our 13 East and Southeast Asia countries with the ones shown by Federico & Tena, whose adjustments and methodology are similar to ours we can see that discrepancies are much smaller and are only relevant for the period 1850-1864 in which they have data for China and we don't and also remarkable during 1870-1879 in which their figures present bigger totals for India than ours. Afterwards, discrepancies between both databases are not significant, being almost always less than 10% of total imports. In the end the closeness between our estimations and Federico Tena proofs the reliability of this newly created database, although we can't fully compare quality of both bases since they only include total trade, while we account for bilateral flows between countries.

Figure 2.8: Discrepancies between A&T and Federico-Tena for Asia (1841-1938)



Sources: See text.

2.5. Mixing Databases Ricardo and A&T.

The main objective of the present paper is to apply this newly created Asian imports database to an economic research about the degree of regional integration in East and Southeast Asia. Prior sections have shown that our information is superior, but we must also recognize the contributions that those previously presented databases have made to our data and, most importantly, to which degree the present database could contribute to the already existing ones.

First of all, there are some periods in which official sources were missing and others in which we considered sources employed by published databases more reliable or accurate than ours. For that reason we've taken data from external databases as we've already mentioned with Japanese imports between 1870-1879 obtained from Barbieri database. In addition, Ricardo data is employed to fill periods in which we lack proper data sources. For example we use Ricardo database, adjusted to our unification criteria, when presenting data for India between 1867-1870, for Sri Lanka (1867) and for Malaysia during 1907-1908. We also take from Ricardo data on total Chinese imports during 1932-34 and 1937 and Chinese imports from Manchuria (1868-1899) and French Indochina (1932-1938). For the case of Japan, as it has been explained before, we obtain imports from Korea using Ricardo database between 1882-1889 and 1900-1918. We also use Ricardo in order to collect Japanese imports by partner in 1862 and 1880-1882. This data source has also been employed for getting Indonesian imports from French Indochina and Siam during 1902-1918 and 1924-1938 and from Korea during 1924-1936. Another country that is complemented using Ricardo database is Siam for which we obtain imports disaggregated by country level between 1910-1918 and 1924-1927.[5] From Ricardo, we've also obtained a full disaggregation of French Indochina imports for the years 1903-1912 and flows coming from Myanmar, India, Indonesia, Philippines and Siam (1913-1918). Finally, we've also used Ricardo for filling Taiwan imports by partner during 1907-1918.

Summing up, we've demonstrated that the collection of data from different sources could contribute to the accuracy of trade statistics, focusing in East and Southeast Asia imports. This idea has inspired us to create a new database that will mix A&T and Ricardo

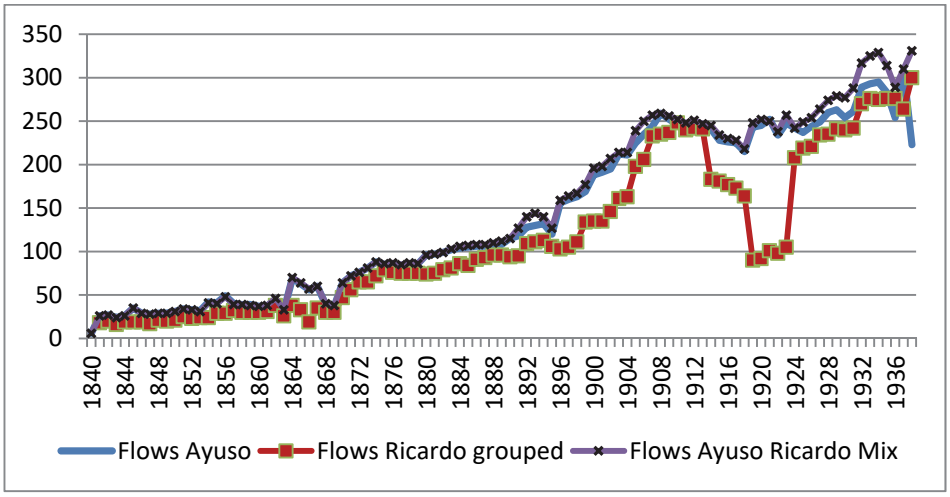
[5] For those periods we have a local primary source as it is the Foreign Trade and Navigation of the Port of Bangkok which has slightly more flows than Ricardo. However we've found that most of these extra flows represent ports and parts of countries. In addition, we believe Ricardo is superior because flows are expressed in Sterling Pounds which is a more stable currency than the Thai Bath employed by the primary source and because they employ natural years, whereas the local source uses the Thai calendar.

trade flows (and also some information from Barbieri) in order to maximize total East and Southeast Asia flows. The new database will be based on A&T reporting countries, because we have data availability for more countries and more years, but will use Ricardo partners whenever a Ricardo importer presents more flows after performing the corresponding country unification and eliminating territories that don't constitute a specific political unit.

In that sense, the new database will include A&T data for India until 1890 and afterwards it will employ Ricardo flows. Something similar happens with Indonesia for which we will employ A&T flows until 1924 and Ricardo ones afterwards. In the case of Japan, we will include data from Barbieri (1870-79) and Ricardo which has a few more partners during 1883-1889. For Malaysia Ricardo partners will be employed during 1861-1879, 1892-1893 and 1924-1936. The rest of countries will mostly use A&T partners with few exceptions: China will use Ricardo on 1905-1907, 1922-1923 and 1938, Indochina on 1938 and Sri Lanka for 1931-1938. Finally, Philippines, Taiwan, Korea and Siam will only employ data from A&T and Myanmar and Borneo just data from Ricardo.

The new constructed database is superior to the other two alone, with a total of 14,876. As explained on this report, most data presented on the 19th century comes from A&T database and for that reason the mixed base presents more or less the same flows until 1890s. Nevertheless, the period in which this new database clearly improves the other two is the interwar years since it employs A&T flows to fill Ricardo's missing data during 1919-1923 and then it uses Ricardo's partners in order to solve A&T stagnation in the number of flows during 1916-1938. All in all, we can appreciate that A&T database is more accurate for the 19th century, whereas Ricardo provides better information for the interwar years.

Figure 2.9: Number of flows per year on A&T, Ricardo and the Mixed database (under A&T unification criteria) 1840-1938.



Sources: See text.

2.6. Measuring regional integration: East and Southeast Asia compared with Europe and Latin America.

As it has been explained on the introduction, the present database has been constructed to make a more precise analysis of the process of commercial integration in East and Southeast Asia. In that sense, the main hypothesis with which we are working is that before WWII regional trade was especially intense in East and Southeast Asia as defended by articles which find that the levels of trade interdependence presented by East Asia countries were higher than those found in North and Latin America or Africa and their growth rate was even faster than the one within Western Europe.

This hypothesis is going to be checked using the database created on section 5 that mixes Ricardo and A&T information in an attempt to offer a high resolution picture of the regional composition of East and Southeast Asian imports. In that sense, the degree of regionalization found on our constructed region is going to be compared with Western Europe which nowadays is considered a successful example of commercial integration and also with levels presented by Latin America at that time, which generally is assumed to be less successful regarding trade between neighbors (Restrepo & Tena, 2016).

Such a comparison will be possible thanks to the employment of Ricardo database for trying to reconstruct Latin America and Western Europe bilateral imports by country

partner for the period 1840-1938.[6] The confection of both databases has followed the same territorial unification criteria as the one performed by A&T, which is described on previous sections. Furthermore, for a better analysis we've also eliminated those flows to which it is impossible to assign a specific political unit. The only adjustments practiced on A&T database that haven't been performed on South America and Europe databases are the elimination of bullion and specie trade and the estimation of the true regional origins of transit trade and. The first adjustment hasn't been possible since we don't have access to each of the original data sources employed by Ricardo in order to check the inclusion of treasury imports. For the second one we've found that the most relevant entrepôts at that time were London or Valparaíso which are hardly separated from the constructed political units of United Kingdom or Chile respectively and Panama entrepôt was not considered to be part of our built South America, so this estimation won't affect regional trade levels (Smith, 1910; Strong, 1925; Martland, 2008). In the end, our Western Europe imports database includes 37,360 flows whereas the South America one presents 10,534.

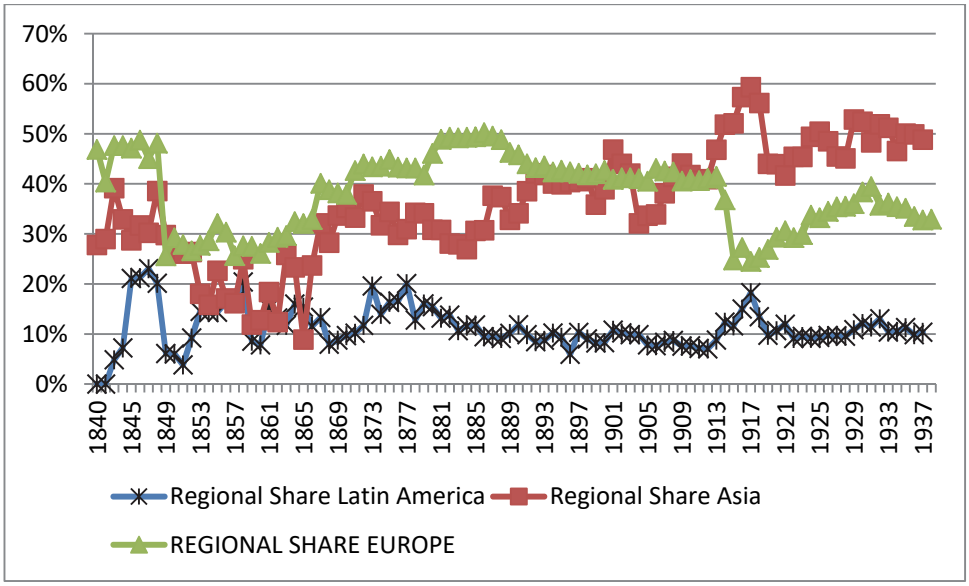
A partial analysis is practiced on figure 2.10 which shows the evolution of the percentage that regional imports represented over the total on each of the three studied areas. There we can see that regional imports were more relevant in East and Southeast Asia than in Latin America for almost the whole century. In addition, we can see that after 1890, the levels of regional trade were very similar between our region and Western Europe, being intra-Asian trade intensity clearly bigger during interwar years. Before that, it is true that Europe presents slightly higher levels of regional integration, but we should consider those figures as an upper bound since we are not accounting for the real origin of merchandise passing through European entrepôts, although it is true that during the late 19th transit in Europe was not very relevant.

In any case, if we want to define the extent of regionalization in a more reliable way, there is a need to control for economic variables affecting regional imports composition like market size or trade costs. For example, the low relevance of trade between Latin American neighbors might be only explained by the low GDP levels

[6] Latin America will refer to the 11 countries that nowadays conform South America: Argentina, Bolivia, Brazil, Chile, Colombia, Guyana (British, French and Dutch), Ecuador, Paraguay, Peru Uruguay and Venezuela. For the case of Western Europe, the reporting countries employed are the members of the so-called EU 15, with the exception of Luxembourg for which Ricardo doesn't have data: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom.

presented by those countries, or the European integration levels might only respond to proximity between trade partners.

Figure 2.10: Share of regional imports over the total in East and Southeast Asia, Western Europe and Latin America (1840-1938)



Sources: See text

With that purpose, we have constructed a Gravity Model in which the dependent variable is going to be imports by country "i" coming from country "j" in period "t" expressed in sterling pounds. Independent variables will be the sum of both partners' GDP, which will approximate market size, and distance between partners which represents trade costs.[7] The key variable for our analysis will be a Dummy which indicates whether the partner is a member of the region or not and a positive and significant coefficient will indicate that countries of a certain region trade more with each other than what their GDPs and distance between them suggest. Finally we will also control for other trade costs like average levels of tariff protection presented by each importer country, reductions in transaction costs generated by colonial relationships or the degree of commercial influence of the USA which nowadays is believed to be quite relevant in Latin America and which was also one of the main partner of the other two regions. The model can be appreciated on Equation 2.1 in which time and importer country fixed effects will be incorporated for

[7] GDP data is expressed on 1990 GK dollars and comes from Maddison Project (2014), while distance refers to Great Circle Distance in nautical miles found on https://www.distancefromto.net/. The estimation of GDP in countries in which Maddison lacks data has followed the same procedure explained on this thesis' appendix.

better control multilateral trade resistance. In addition, it will be estimated with panel techniques and all the variables will be logged.

$$Imports_{ij,t} = \beta_0 + \beta_1 GDP_{ij,t} + \beta_2 Distance_{ij,t} + \beta_3 Tariffs_{ij,t} + \beta_4 Region_{ij,t} + \beta_5 Colony_{ij,t} + \beta_6 USA_{ij,t} + \beta_i + \beta_t \quad \text{(EQ 2.1)}$$

The results of performing this regression confirm the superior degree of regional integration experienced by East and Southeast Asia with respect to Western Europe and Latin America. In table 2.3 we can see that regional imports on this area were higher than what partners' GDP and distance between them might indicate. In addition, this coefficient doubles the one presented by Western Europe, so we can conclude that East and Southeast Asian regional trade intensity was bigger than European one.[8] The contrast is even bigger if we compare our region's integration with Latin American one, which according to our results was not even significant.

The rest of variables present the expected coefficients since imports are growing with market size and decreasing with trade costs with the exception of tariffs which have a positive impact on Latin and European imports. Besides, the surveyed countries traded with their colonial partners more intensively than what gravity suggest, being this colonial intensity higher for East and Southeast Asia countries. Last, but not least, we can see that the USA was a relevant trade partner for Asian and European importers, but not for Latin America which traded with their Northern neighbors less than what GDP and distance with each other would indicate. This would nevertheless be aligned with historiography pointing that US interest on Latin America during the second half of the 19th century was more focused on the procurement of coffee and sugar. In fact, many authors argue that South America imports from the United States didn't almost grow between 1865 and 1897, while the main source of imports was Great Britain (Schultz, 2009, pp. 78-90).

[8] Results in table 2.3 are telling that East and Southeast Asia imports from its regional partners are 236% higher than imports from the rest of the world, whereas in W.Europe imports coming from regional partners were only 84% higher than those coming from other parties ($100[exp(\beta_4) - 1]$). Giles (2011).

Table 2.3: Regression results for East and Southeast Asia, Western Europe and Latin American imports (1840-1938).

VARIABLES	(1) E & SE. Asia Sample	(2) Europe Whole Sample	(3) America Whole Sample
GDP	0.781***	1.227***	1.482***
	(0.0349)	(0.0337)	(0.0310)
Distance	-0.703***	-0.677***	-0.952***
	(0.0315)	(0.0104)	(0.0513)
Tariffs	-0.428***	0.0658*	0.430**
	(0.0644)	(0.0355)	(0.212)
REGIONAL	1.212***	0.610***	-0.191
	(0.0796)	(0.0364)	(0.126)
COLONY	3.760***	0.828***	1.385***
	(0.0687)	(0.0387)	(0.181)
USA	1.552***	1.753***	-0.471***
	(0.0837)	(0.0696)	(0.0795)
Constant	5.201***	3.903***	4.122***
	(0.375)	(0.366)	(0.677)
Observations	17,450	37,271	10,534
Number of YEAR	99	99	98

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Conclusions obtained from table 2.3 are revealing, although they correspond to a long time period (almost 100 years). For that reason, we've decided to divide the analysis in two differentiated sub-periods in order to distinguish the first globalization years from the interwar period which was clearly one of commercial disintegration at a global level and construction of regional trading blocs. All those features are represented on table 2.4 were we can see that regional trade was more intense during interwar years in every studied region. Colonial trade became reinforced at W. Europe and Latin America but not at East and Southeast Asia, while the opposite happened with the influence of the USA as a partner which was reduced in Europe while incremented on Asia and Latin America.[9] Nevertheless, the most important conclusion is that regional intensity was bigger in East and Southeast Asia than in the rest of analyzed areas at every period.

[9] (Makower, 1954, pp 1-14) points that Latin America industrialization during the 1920s demanded US machinery and it permitted this country to strength its position versus Western Europe. Nevertheless, our results still show that South America imports from the USA were still lower than what gravity forces suggested.

Table 2.4: Regression results for East and Southeast Asia, Western Europe and Latin American imports (1840-1913 and 1914-1938).

VARIABLES	E and SE Asia pre WWI	E and SE Asia post WWI	Europe Pre WWI	Europe Post WWI	America Pre WWI	America Post WWI
GDP	0.618***	1.016***	1.237***	1.181***	1.360***	1.624***
	(0.0301)	(0.0606)	(0.0411)	(0.0603)	(0.0313)	(0.0488)
Distance	-0.670***	-0.685***	-0.715***	-0.596***	-0.987***	-0.918***
	(0.0290)	(0.0527)	(0.00979)	(0.0163)	(0.0565)	(0.0695)
Tariffs	-0.0496	-0.856***	0.364***	0.00631	0.609**	0.285
	(0.0931)	(0.108)	(0.0518)	(0.0590)	(0.261)	(0.214)
REGIONAL	0.765***	1.869***	0.558***	0.687***	-0.275**	-0.219
	(0.0746)	(0.0878)	(0.0509)	(0.0460)	(0.125)	(0.167)
COLONY	3.992***	3.183***	0.664***	1.166***	1.339***	1.961***
	(0.0635)	(0.0886)	(0.0298)	(0.0607)	(0.184)	(0.278)
USA	1.185***	1.832***	1.819***	1.656***	-0.664***	-0.327***
	(0.0820)	(0.163)	(0.0746)	(0.130)	(0.0869)	(0.124)
Constant	6.165***	5.832***	4.607***	4.178***	5.231***	1.481
	(0.381)	(0.577)	(0.463)	(0.726)	(0.795)	(0.962)
Observations	9,290	8,160	23,563	13,708	4,824	5,710
Number of YEAR	74	25	74	25	73	25

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

The failed regional integration of South America at the analyzed period has been widely surveyed by scholars. Factors like the region's wide geographical dimension, low levels of activity or high levels of protectionism undermined intra-regional trade (Elliot, 2006; Badía-Miró et al., 2014). Anyway, we must be careful with our results since the literature has shown that one part of the region composed by today's MERCOSUR countries presented a strong intraregional bias before WWII which in the countries of the Andean Community only manifested on the second half of the 20th century (Restrepo-Estrada & Tena-Junguito, 2016).

What seems more unexpected at first sight is the lower regional trade propensity of European countries compared with East and Southeast Asia, although it was already mentioned by some authors (Petri, 1993). In that sense, there are many different factors explaining superior East and Southeast Asian regional integration prior to WWII. On the following chapter we will show that this modern regional integration had its origins on the second half of the 19th century thanks to the spread of transit networks created by the British around Hong Kong and Singapore and managed by Chinese and other local

merchants. Intra-regional trade was then fueled by demand complementarities that arose during the subsequent industrialization processes experienced by almost every country inside the region across the whole 20th century. The first one was Japan, whose economic development was linked with its imperial expansion and similar dynamics have been repeated during Southeast Asia industrialization in the 1960s and 1970s and Chinese and Indian ones during 1980s and 1990 as will be explained on chapter 3.

Apart from that, the construction of East and Southeast Asia as a regional entity might be controversial since it includes a region like South Asia, that has been very active historically, but which doesn't share most of the cultural tights existing among East and Southeast Asia countries. The main motives behind its inclusion are historical commercial links with China and the share of British networks and institutions with Malaysia, apart from the spread of Indian merchants all over Southeast Asia which contributed to commercial trade inside the region. Anyway, the constructed database permits us to see if the inclusion of South Asia explains by itself the special regional intensity found in East and Southeast Asia. Under this premise, we've calculated the levels of regional integration once South Asian territories have been eliminated and results in table 2.5 reveal that East and Southeast Asian regional integration is still remarkable and superior to European one. Furthermore, coefficients are higher this time, suggesting that intra-regional trade was slightly undermined rather than enhanced by the inclusion of South Asia territories.

On the other hand, it is possible that imperial aims of European countries, especially the British, diverted trade away from regional partners and in favor of colonies all over the world. This could explain the lower degree of regional imports presented by Western Europe at the analyzed period, although historiography arguments that European empires valued more their colonies as a market than as a source of primary products, so imperial diversion would be more noticeable if we dealt with exports rather than imports (Meredith, 1996). In fact, results in tables 2.3 and 2.4 confirmed this hypothesis because the coefficient of colonial imports is much higher for East and Southeast Asia than for Europe.

Table 2.5: East and Southeast Asia trade determinants without South Asia territories (1840-1938)

VARIABLES	(1) Whole Sample	(2) Pre WWI Sample	(3) Post WWI Sample
GDP	0.695***	0.488***	1.018***
	(0.0431)	(0.0404)	(0.0642)
DISTANCE	-0.577***	-0.499***	-0.585***
	(0.0335)	(0.0335)	(0.0520)
TARIFFS	-0.343***	0.226**	-0.837***
	(0.0861)	(0.111)	(0.104)
REGIONAL	1.309***	0.817***	1.939***
	(0.0814)	(0.0966)	(0.0845)
COLONY	3.140***	3.090***	2.868***
	(0.0430)	(0.0594)	(0.0488)
USA	1.710***	1.287***	1.785***
	(0.0731)	(0.0716)	(0.139)
CONSTANT	6.447***	7.409***	6.620***
	(0.415)	(0.450)	(0.602)
Observations	11,453	5,744	5,709
Number of YEAR	99	74	25

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

Finally, we also believe that Europe could suffer certain geographic disadvantages difficulting intra-regional trade expansion before the Treaty of Rome. For example, some territories taking part of Western Europe had no access to the sea, something that undermines openness to foreign trade and reduces the degree of commercial exchanges between neighbors (Satyanugroho, 2018). Such landlockedness was also demonstrated to harm Central Asia's trade (Raballand, 2003), so we have decided to check for the relevance of this circumstance on the explanation of Europe's intra-regional trade by eliminating from the sample those Western European countries which are landlocked. In this case, we have only eliminated territories corresponding to the Austro-Hungarian Empire and results confirm that European landlockedness undermined regional integration since now coefficients shown by the regional dummy are higher than before at every period, especially after WWI. Nevertheless it doesn't explain by itself the superior levels of intra-regional trade offered by East and Southeast Asia, since their regional dummy still presents bigger coefficients for every period. In addition, we will demonstrate in the next chapter

that access to the sea was not a definitive determinant of East and Southeast Asian regional integration. [10]

Table 2.6: Regression Results for Western Europe countries with access to the sea (1840-1913 and 1914-1938).

VARIABLES	(1) EU15 No landlocked Whole period	(2) EU15.No landlocked.Pre WWI	(3) EU 15 No landlocked. Post WWI
GDP	1.205***	1.243***	1.112***
	(0.0310)	(0.0457)	(0.0696)
Distance	-0.666***	-0.724***	-0.545***
	(0.0136)	(0.0110)	(0.0165)
Tariffs	0.0527	0.364***	-0.0611
	(0.0385)	(0.0521)	(0.0706)
REGIONAL	0.775***	0.619***	1.060***
	(0.0396)	(0.0414)	(0.0558)
COLONY	0.814***	0.673***	1.117***
	(0.0381)	(0.0297)	(0.0608)
USA	1.927***	1.880***	2.077***
	(0.0587)	(0.0772)	(0.126)
Constant	3.034***	2.638***	3.538***
	(0.345)	(0.490)	(0.938)
Observations	36,118	23,034	13,084
Number of YEAR	99	74	25

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

All in all, looking at the literature and results obtained, it seems that European lower levels of intra-regional trade at that time compared with Asian are explained by two main reasons. On the one hand, certain historical events granted an extraordinary regional integration in East and Southeast Asia at a time in which most part of the region wasn't industrialized. On the other, European countries characterized by a higher economic development, relied more on market and demand conditions in order to decide their imports sources. As a consequence, they were more diversified all over the world as it is reflected on the higher coefficients presented by GDP variable and USA dummy. The following chapter is going to analyze in a deeper way whether economic determinants were also

[10] Another option for checking this was to add Central or Western Asia landlocked countries to the analysis but as it has been mentioned on section 2, they belong to a different region, so their incorporation to the analysis would be equivalent to add Eastern Europe countries to the Western Europe sample or North American ones to the Latin American sample.

explaining Asian regional integration or, as we believe, were historical events the ones motivating the intra-regional trade expansion appreciated on this chapter.

2.7. Conclusions

The present paper intends to throw more light in the debate about commercial integration in the periphery by adding a long run perspective. In order to do that, we analyze the evolution of East and Southeast Asian regional integration and demonstrate by means of a Gravity Model that before the Second World War it was superior to the European or Latin American ones in spite of its GDP and geographical disadvantages.

With this objective in mind we have constructed a bilateral imports database which covers commercial exchanges between 13 East and Southeast Asia countries and each of its partners for almost a century that goes between 1840 and 1938. To our knowledge, this is the first attempt to reconstruct trade flows for all the countries in the region during such a long time span, using mostly local statistics and maintaining consistent unification criteria. For that reason, the core of the paper has dealt with explanations regarding sources employed for disentangling bilateral trade for each country, data transformation performed in order to adapt original information to our research needs and assessments of the statistical validity of this new database. This last step has consisted on a comparison of total imports and number of flows presented by every country on our database with information obtained on multipurpose international databases that also cover East and Southeast Asia area.

What has been obtained is that the present database in general provides superior statistics than the ones of Ricardo, Fo-Hu and Barbieri. Specifically, our database contains information for more years and more reporting countries than the others and for that reason it includes many more flows. Ricardo database is the only one that gets close to our estimates if we perform a more exhaustive analysis since for most of the century both databases present a similar number of flows when we only consider reporting countries common to both databases. Such statistical similarity is mostly explained by the territorial adjustments performed in our database's partners intended to conform consistent political units and which diminish the number of flows presented by our data contrasted with Ricardo. In fact, if a similar territorial unification is applied to Ricardo we obtain that our database presents more flows per reporting country for every period with the exception of the last two decades (1920-1940). The validity of our database is countersigned when we analyze total imports presented by the region: our database shows higher totals than

Ricardo for almost the whole period and the years in which their imports are bigger are explained by the subtraction of bullion and specie and elimination of coastal trade performed in our data. Furthermore, our totals are very close to Federico& Tena ones, whose internationally approved estimates are obtained following similar criteria as we do, adding validity to our database.

In any case and despite the manifest quality of the recently created database, we believe that in order to perform the most reliable analysis of regional intensity in East and Southeast Asia trade it is necessary to complement our database with information from Ricardo at those countries and periods in which their quality was noticeably superior. Basing on this mixed database we have created a Gravity Model which is employed to demonstrate that East and Southeast Asian regional trade was more intense than what market size and trade costs shown by those countries might suggest and that this intensity was bigger than the one exhibited by countries in Western Europe and South America before and after WWII. In this line, the following chapter will check if Asia's exceptional intra-regional trade had its origins on certain historical events, or if market forces were more relevant as happened with Western Europe.

3 CHAPTER 2: NATURAL TRADING PARTNERS? POWER AND HISTORICAL NETWORKS IN EAST AND SOUTHEAST ASIAN INTEGRATION (1840-1938)

3.1. Introduction

Findings contained on the first chapter might contribute to the debate about the necessity of deepening the integration process inside East and Southeast Asia (Webber, 2001).[11] Notwithstanding, the discovery of an intra-Asian regional trade superior to Western Europe and Latin American ones before the signature of any FTA, could catalogue those territories as "Natural Trading Partners". In case these special trade relationships are confirmed, this would enhance the welfare created by hypothetic Customs or Monetary Unions signed on the region.

In this regard, this article wants to conceptualize the previously found regional trade intensity by demonstrating that East and Southeast Asia countries were Natural Trading Partners. For doing this, we will study the degree of regional trade in East and Southeast Asia long before the creation of any Free Trade Area, including also potential South Asia partners like India or Sri Lanka. The region has been commercially active since ancient times and most important of all, by the early 20th century its levels of regional trade were comparable to those in Europe as we've seen on the previous chapter (Petri, 1993). How was it possible for a relatively poor region like that (Basino, Forthcoming)?[12] In the case of Western Europe it seems that countries based their commercial decisions on economic variables but this article is going to show that the case of East and Southeast Asia was rather different.

These theoretical determinants have been widely analyzed by scholars dealing with Natural Trading Partners' hypothesis. Nevertheless, this literature doesn't pay enough attention to historical developments that might have favored special trade relationships

[11] Those discussions crystallized in 1992 when the Association of Southeast Asia Nations (ASEAN) became a Free Trade Area in 1992, consolidated in 2015 when ten Southeast Asian countries formed the ASEAN Economic Community (AEC). Nonetheless, the Asian Financial Crisis in 1997 showed the weaknesses of ASEAN and revealed the need for enlarging the integration process in order to fight foreign influence. A possibility that is on the table is the creation of a Currency Union on ASEAN to which countries like Japan, Korea and China might join into an organization called the ASEAN Plus Three (APT).

[12] Relative poverty refers to the comparison with the European core and USA. We acknowledge that the region was not uniform and living standards in Southeast Asia were higher than in India and China.

between different territories. In that sense, the main contribution of this article consists of bringing a historical perspective to Natural Trading Partners' literature through the analysis of those special events that upgraded region's intrinsic economic advantages in order to forge East and Southeast Asia commercial integration.

As the historiography has demonstrated, commercial networks were quite active in East and Southeast Asia since the 15th century (Age of Commerce), but they acquired a new dimension from the second half of the 19th century (Age of Empires). The years previous to this shift saw trade dominated by exchanges of silver and opium between China and India, orchestrated basically by Great Britain. This trade was affected by subsequent restrictions during the 1830s and 1840s which lead to the Opium Wars won by the British. As a result, they forced the opening of Chinese ports to free trade and developed an intense commercial network linking Europe with China and India across the British intermediate ports of Hong Kong and Singapore. Consequently, the rest of European empires settled in the region like the Dutch, the French or the Spanish (replaced by the USA in 1898) started to adhere to this network and to improve it through investment in transport and communications infrastructure.

This sequence of events not only facilitated the integration of the region on the global economy but also permitted the development of a purely regional network in East and Southeast Asia. According to our data, the first traces of this intensification date back from the 1860s and 1870s in which the transit networks created by the British started to get exploited by Chinese merchants dispersed all over the region. The study of the construction of Chinese and other local networks like Hindi or Malay and their interactions with imperial ones contribute to a vast literature about commercial networks and their influence on regional integration. Those merchants mainly transported goods from Southeast Asia territories towards China and other countries in the region, using Hong Kong and Singapore as entrepôts until the late 1890s. At the same time, British colonies started to get rid of reduced transaction costs generated by imperial policies to raise commercial exchanges between them. Nevertheless, after WWI, the British dominion of regional trade was substituted by the newly created Japanese Empire which employed the growing intra-regional trade in order to sustain its industrialization. Furthermore, direct routes between countries in the region substituted transit once the information costs of entry in China's market vanished.

All in all, the objective of the present paper is twofold: to demonstrate that East and Southeast Asia countries were Natural Trading Partners and to show that this singularity is shaped by historical events. For that purpose, we will employ the previously described imports database, which in this case won't be mixed with Ricardo because we want to preserve the treatment to transit trade provided in our database in order to better explain a phenomenon that was decisive on the region's early contemporary integration.

Our conclusions will point that East and Southeast Asia countries might be considered Natural Trading Partners because they satisfied a set of conditions long before the creation of any Free Trade Area. Those special commercial relationships are maintained until today thanks to a sequence in which each country employed local raw materials and exported manufactures to its neighbors during every industrialization process (Sugihara, 2019). The mentioned interactions were based on low transaction costs and demand complementarities inside the region during pre and post WWII but we demonstrate that the roots of post-Industrial Revolution regional integration in East and Southeast Asia laid on the transit networks created by the British around Hong Kong and Singapore and managed by Chinese merchants. Those networks were supported by British colonial aspirations and investment in infrastructure. Furthermore, regional integration was subsequently consolidated during the interwar years through the exercise of imperial power from Japan, whose influence seems bigger than the British because its planned industrialization had an impact on the above mentioned demand complementarities and was also sustained by investments in railway and local commercial networks.

In that sense, section 2 will look at the different theoretical and historical factors that, according to the literature allowed countries in the region to become Natural Trading Partners. Section 3 in the paper will provide some descriptive statistics about the evolution of imports in the region and their main features. Sections 4 and 5 will describe the model employed and characteristics of the database, while section 6 will bring the principal results and section 7 the main conclusions.

3.2. Theory and History on Natural Trade Blocs

As it has been mentioned in the introduction, the establishment of a Free Trade Area between Natural Trading Partners might be welfare enhancing. In that sense, a review of the literature brings three different conditions that determine whether two countries are Natural Trading Partners before the signature of any FTA. The first one is that those countries trade more with each other than with the rest of the world (Lipsey, 1960), the

second is that countries trade disproportionately with their neighbors (Summers, 1991) and the last one that those territories show demand complementarities (Schiff, 1999).

In the end, one of the main objectives of the following chapter is to demonstrate that East and Southeast Asian countries were Natural Trading Partners since they met each criteria before 1938: The growth in intra-regional trade surpassed the one with the rest of the world (Sugihara, 1985), they traded with each other more than what gravity forces may indicate (Sugihara, 2005; Petri, 1993) and they presented demand complementarities (Sugihara, 2019). The following section is intended to provide some theoretical and historical mechanisms explaining those special commercial relationships between neighbors in East and Southeast Asia at that time.

3.2.1.Theoretical Determinants: Trade costs, demand complementarities and factor endowments

The most basic versions of the Natural Trading Partners' hypothesis remark that trade between neighbors might be specially intense because trade costs between them are small. This idea is defended by (Wonnacott and Lutz, 1989) or (Krugman, 1993, pp. 58-79) among others. In that sense, the archipelagic character of East and Southeast Asia territories might favor their commercial integration with each other since access to sea contributed positively to region's international trade (Satyanugroho, 2018), while Central Asia's landlockedness undermined trade (Raballand, 2003).

Alternatively, other authors conclude that two countries will trade intensively in manufactures if they have similar demand structures (Linder, 1961). An alternative theory also deals with demand, but opposing Linder it defends that countries are more likely to trade with each other if their demands are different and one country imports what the other exports (Schiff, 1999). This could be the case of East and Southeast Asia in which on the one hand Japan exported mainly heavy industrial products to its colonies (in exchange of rice and raw materials) and cotton textiles to the rest of the region. On the other hand, Southeast Asia countries mostly exported primary products: Indonesia exported sugar as well as rubber, which was also highly exported by British Malaya across with tin, whereas Burma, Thailand and Southern Vietnam became rice exporting regions (Booth, 2007; Bassino 2000).

This intraregional specialization is also reflected on British India which exported manufactured goods to Southeast Asia in exchange of primary products and followed an

opposite pattern, exporting raw cotton to Japan. Besides, it also heavily exported opium and cotton manufactures to China, which in turn was a tea and silk exporter (Sugihara, 1985; Keller & Shiue, 2011 and Latham, 1978). There is a vast literature dealing with demand complementarities inside East and Southeast Asia and how they prevailed on the industrialization processes arising after the Second World War, guaranteeing high levels of intra-regional trade that persist nowadays (Sugihara, 2019). Nevertheless, on next chapter we show that part of this intra-regional specialization might be institutionally driven (Ayuso-Díaz & Tena-Junguito, 2019)

Finally, a set of authors rather argue that differences in factor endowments are the drivers of regional trade. It is the case of the famous Hecksher-Ohlin model (Ohlin, 1952). Summing up, economic theory brings some factors that might explain the intensity of regional trade in East and Southeast Asia on the period studied. Nevertheless, we provide some historical events that influenced these economic variables, like imperial networks created by western institutions and enlarged through investment in infrastructure and the connections established by local merchants all over the region.

3.2.2. History of Imperial policies in East and Southeast Asia.

From the late 18th to the first half of the 20th century, the region we are studying was occupied by empires of different nature and subject to different policies and regulations, being the British and Japanese Empires the most influential. The former started their dominion over the region in 1757 through the East India Company and its army rule in India. After 1858, it was the British Crown which administered this territory and further conquests, a mandate which was prolonged until the mid-20th century in most cases (Bose & Jalal, 2017, pp. 67-107). On the other hand, the construction of the Japanese Empire was fast since most of it was completed between 1896 and 1915. The commercial preeminence obtained during WWI and the establishment of an imperial bloc policy in the 1930s consolidated Japanese dominion over East and Southeast Asia. (Ayuso-Díaz & Tena-Junguito, 2019).

Historiography has widely demonstrated the positive links between colonies and trade expansion through reductions in transaction costs or the application of discriminatory policies. Nevertheless, colonial regimes established in the region were not homogeneous, and this shaped the different trade behaviors appreciated on this research. Commercial policies were not uniform inside the region as the Japanese Empire established a system of preferential colonial access and discrimination to foreign products following American and

French policies on the Philippines and Indochina respectively. By contrast, the regimes established on Siam, Indonesia and specially the British Empire were more liberal. The Great Depression and the 1932 Ottawa agreement changed this landscape after the British imposition of imperial preferences (Booth, 2003; Chase, 2004; Ferguson, 2003).

Empires also fostered regional trade through investments in infrastructure, while the economic policies applied on conquered territories facilitated the intra-regional specialization mentioned before: British capital and expertise favored India industrialization and, most importantly, the Japanese Government actively supported the establishment of new industries after the Meiji restoration (Roy, 2002; Tanimoto, 2019; Booth, 2007a). Apart from that, the creation of currency blocs during the 1930s strengthened intra-empire trade. This phenomenon affected British and Japanese colonies, although implementations differed since international transactions inside the Japanese Empire were carried by Central Banks, while the Sterling Bloc relied on government intervention to fix exchange rates (Eichengreen & Irwin, 1993; Moon, 2008). Besides, membership on Sterling bloc was supposed voluntary, whereas entrance on the Yen bloc responded to Japan's needs (Hunsberger, 1938).

Finally, different treatment of Chinese immigrants would condition their merchant activities: in general regional empires favored a policy of open frontiers (Kaur, 2009), although some territories like British Malaya, Burma, Dutch East Indies and French Indochina applied ethnic segmentation policies. On the other hand, in the Philippines or Siam intermarriage was encouraged, and Chinese enjoyed unrestricted access to business (Sidel, 2008).

In conclusion, imperial activity in East and Southeast Asia was everything but uniform, although all of them shared common features like commercial policies, investment in infrastructure or the establishment of currency blocs that reduced transaction costs and contributed decisively to the creation of active commercial networks inside the region. The most dense one was created by the British and looked for an easier access to China by Western Powers, using Singapore (British since 1819) and Hong Kong (1842) entrepôts. During the first stages of network construction there was some trade diversion towards imperial masters and colonial partners but the process culminated once Western Powers

could reach China directly and countries inside the region started to exploit these networks for expanding intra-regional trade (Xu, 2015, pp-91-126). [13]

3.2.3. Local merchants and their influence over regional trade across history.

One of the main hypotheses of this research is that the efficacy of imperial institutions and investments depended on the activity of different local trading communities. In that sense, links between Chinese migrant networks and international trade based on information sharing or sanctions enforcement were already demonstrated by the literature dealing with the late 20th century (Rauch & Trinidade, 2002). The following paragraphs will, however, review how Chinese and other regional migrants facilitated East and Southeast Asia commercial integration long before, from the second half of the 19th century.

The first contacts between the Chinese and their Southeast Asian neighbors go back in time more than 2000 years when Chinese soldiers got rid of inland contiguity for reaching Indochina and Siam in the Third century B.C, Myanmar and Siam later and finally overseas Malaya or Sumatra. The origins of those migrants were varied: Cantonese was the predominant group in Siam, the Federated and Unfederated Malay States and were important on the rest of the region, whereas Fukien Chinese were the majority on the Straits Settlements and Indonesia (Purcell, 1966). The process of southern migration was accentuated during the 17th century internal conflicts after the fall of the Ming dynasty, although the new rulers kept strong restrictions to migrations abroad. Those restrictions were gradually lifted by the forced signature of treaties with foreign Imperial Powers (Mc Nair, 1923) leading to an escalation of migration to Burma, Malaya and Thailand after 1881 (Huff & Caggiano, 2007). Furthermore, after 1928 there was a relevant expansion of Chinese migration to Manchuria, linked with the infrastructure development of the territory (Lattimore, 1932).[14]

In the end, the Chinese diaspora supposed around 5% of total Southeast Asia population but was economically influential thanks to dedication to retail activities (Purcell, 1966). First of all, Chinese merchants started dominating regional transit trade through their

[13] In the end Singapore dominated regional transshipment, while Hong Kong became more international.

[14] We should highlight that migrants from different Chinese regions established independent networks employing their own dialects as seen on Sang (1982). In any case the mechanisms by which each independent network favored regional trade were very similar, that's why the concept of Chinese merchant networks employed on this paper encompasses all independent networks.

merchant communities in Singapore and Hong Kong often acting as Compradores carrying operations for Western enterprises or forming their own companies (Rawski, 1969; Post, 2002). In addition, Chinese intermediaries supported the penetration of British capital investments that permitted the development of transports and telecommunication infrastructure, from which they benefited substantially (Duara, 2010; Shuyong, 1997; Xu, 2015).

Afterwards, with the entrance of the 20th century, the relevance of regional transit trade started to decrease as direct connections between Asian ports became more profitable (Keller & Shiue, 2011). However, the Chinese merchants still controlled most retail and wholesale trade in Siam, the Philippines, French Indochina or Malaysia (Huff, 2003; Fukuda, 1995, pp. 62, 72). What's more, during the interwar years the dominion of regional trade in East and Southeast Asia shifted towards the Japanese Empire which was completing its industrialization as analyzed in the following chapter, and employed Chinese intermediaries for distributing light manufactures towards Southeast Asia.

Nonetheless, the support of China migrants to intraregional trade expansion was not limited to the activity of merchants. The settlement of Chinese day laborers relieved labor scarcity at land abundant Burma, Siam or French Indochina, generating a surplus of rice which was exported to British Malaysia, Dutch Indonesia or Philippines in order to feed a growing number of Chinese workers in mines and plantations (Tagliacozzo & Chang, 2011, pp. 336-359; Huff & Caggiano, 2007).

Apart from the Chinese, other local merchants participated on regional exchanges. A prime example was the construction of a network of Malay traders since the Middle Ages, which reached the Straits Settlements, Indonesia, Brunei and North Borneo (Hussin, 2005). After 1850 they were overcame by the Chinese, with whom they cooperated throughout the whole studied period (Kobayashi, 2019; Cleary, 1996). Other relevant network was constructed by Indian traders which controlled maritime trade with the rest of Asia between 1850 and 1914 (Markovits, 2000, pp. 1-20) and land trade with China through a community in Xinjiang (Thampi, 2010).

Summing up, it seems that economic variables like demand complementarities have maintained high levels of intra-Asian trade for Centuries, until very recently. Nevertheless, this paper tries to demonstrate that the explosion of regional trade during the Age of Empires was possible thanks to interactions between imperial policies, infrastructure and local networks, promoted by the British (19th century) and the Japanese

(interwar) Empires whose activities also fostered those complementarities. This combination significantly reduced transaction costs and generated synergies, expanding the scale of trade inside the region. A final historical event like the late adoption of the Gold Standard by East and Southeast Asia countries could also be considered as decisive in the establishment of intense trade relationships inside the region since most of them were Silver based, whereas the rest of the world was using Gold. Nevertheless, our research in Appendix A shows that there weren't significant reductions in imports from Gold Standard countries at any period, so this phenomenon can't be consider transcendental, although Silver devaluation on the late 19th century facilitated regional exports.

3.3. Regional Trade and its Determinants

The present article intends to cover the longest possible period before WWII for a better understanding of historical commercial integration in East and Southeast Asia. We are concerned about the long tradition of commercial networks inside our region which experienced an "Age of Commerce" characterized by commodity trade and the construction of networks connecting every territory from Calcutta to Nagasaki, transforming the region into the center of world trade between 1450-1680 (Reid, 1988, 1990; Morgan, 2019). The subsequent decades brought commercial restrictions for containing European advancement, although they couldn't avoid British and Dutch monopolies that enlarged regional networks after 1760 (Reid, 1997).

Sadly, for those years there is only data about trade flows in specific ports and that's why our study starts in 1840 when we obtain disaggregated imports for a full country like British India. The beginning of this research coincides with the denominated "high colonial era" after the end of monopolies. This era incorporated manufacturing products to commercial exchanges in the region (Sugihara & Kawamura, 2013) apart from other features summarized in the following section.

3.3.1. Regional imports evolution

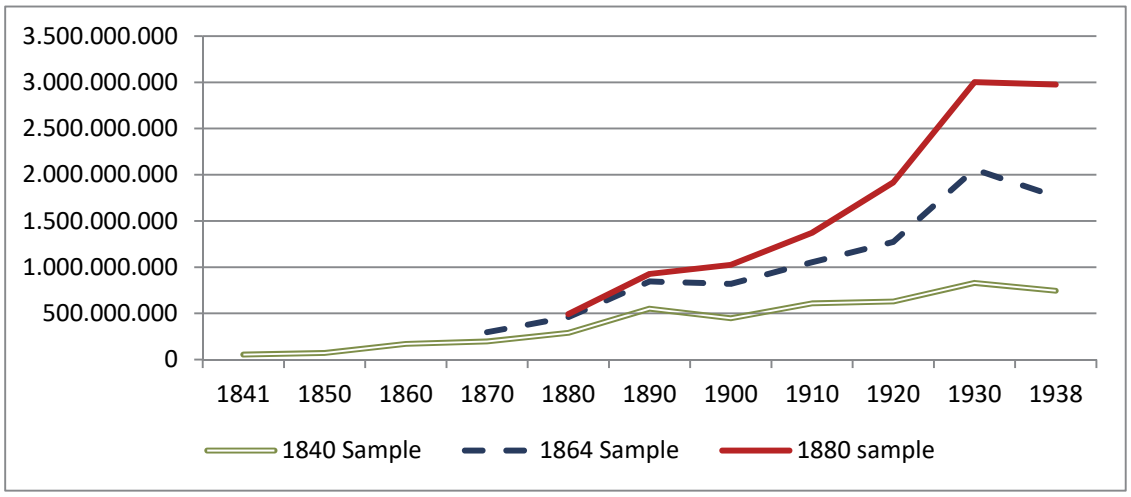
The period which we are studying is a key one for East and Southeast Asian countries. During the century that goes between 1840 and 1938, countries in the region got integrated on the global economy. This phenomenon can be appreciated on figure 3.1 in which we can see the evolution of imports in 1910-14 dollars for three different samples that respond to data availability as explained on section 5. There we can see that constant imports grew at a modest and irregular rate during 1840-1860 and experienced a first

prolonged increment during 1870-1890. Finally, the entrance of the 20th century supposed an important increment of trade by the analyzed territories which only slowed down after the Great Depression.

As it has been mentioned on the previous section, the first condition that territories inside a region should met to be considered Natural Trading Partners is that trade between them surpasses trade with external partners. For that reason, figure 3.2 compares the share of imports coming from East and Southeast Asia partners with those from Europe, America and other territories. There we are able to distinguish three stages: immediately after colonization (1840-1863) there was trade diversion towards European Empires and other colonial territories in Africa and Oceania. Shares' volatility could reflect that levels of total imports were low and that regional networks were being constructed.

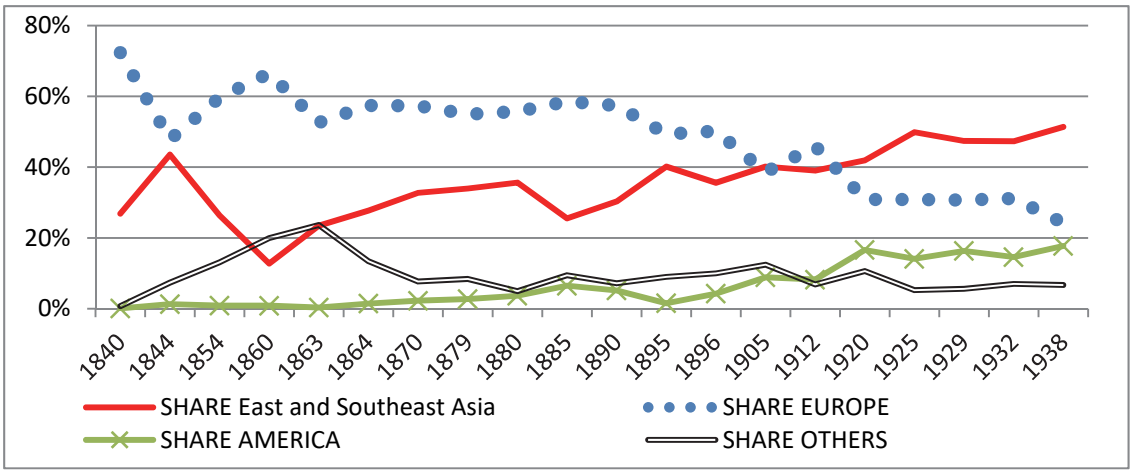
The first traces of regionalization are appreciated on the second stage (1864-1879) in which our studied countries started to trade more with each other and less with their colonial Masters, although Europe was still dominant thanks to the vigor of Germany or Russia, consolidating East and Southeast Asian integration on the global economy. Finally, the third stage (1890-1938) shows the culmination of regionalization as imports diversified away from Europe and towards regional partners. Summing up, we can appreciate a tendency towards trade within the region (more than 50% of imports in the 1930s were regional) and away from the outside, meeting the first criterion to consider those countries as Natural Trading Partners. A deeper study will look at the main characters of this regionalization and variables facilitating it.

Figure 3.1: East and Southeast Asia Constant Imports 3 different samples (1840-1938)



Sources: See text.

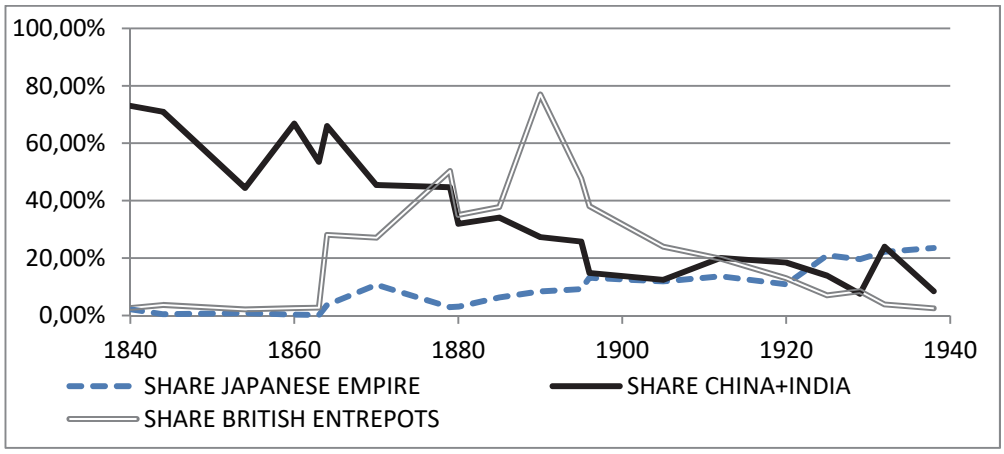
Figure 3.2: Regional Distribution of East and Southeast Asian imports 1840-1938



Sources: See text.

Below in figure 3.3 we can see the shares that historically dominant Asian partners represented over total regional imports. During the 1840s most imports came from China and India, the biggest in the region and centers of medieval and modern local networks. The quantities imported were negligible at that time and based on exchanges between opium and silver, that's why restrictions on opium trade coincided with a reduction of trade between these territories and a consequent decline in regional imports. The aftermath of the Opium Wars supposed the consolidation of British influence over the region through the creation of transit networks based on Hong Kong and Singapore entrepôts. Surprisingly, transit trade starred the first big push to regional integration between 1864 and 1890. Finally, with the entrance of the 20th century, transit networks decayed but regional trade in East and Southeast Asia continued expanding thanks to the creation of direct connections between ports and the imperial and industrial expansion of Japan during 1895-1938 whose share over regional imports surpassed the others after WWI.

Figure 3.3: Partner Decomposition of Regional Imports in East and Southeast Asia 1840-1938.



Sources: See text

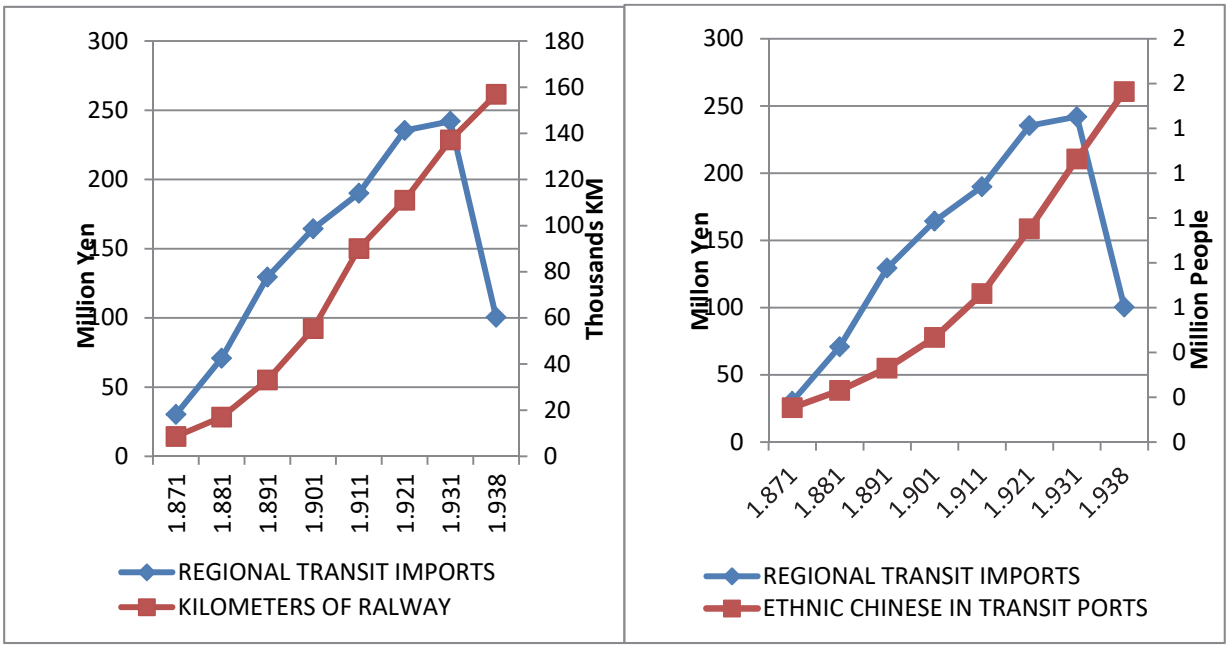
3.3.2. First regional expansion: Transit trade and its determinants

One of the most important intuitions confirmed previously is that the origins of modern regional integration are correlated with the expansion of transit trade through Hong Kong and Singapore. As it has been explained before and, discussed in detail on Appendix A, those networks were built after the end of Opium Wars (1842), fueled by Western desires to reach China safely. After 1860 increases on trade scale made the direct access to China more profitable to Europeans, but transit networks became attractive to neighbor territories, which adhered to the network originating a true regional integration lasting until 1920s once direct trade with China also became profitable for poor regional countries.

Definitely, the construction and evolution of transit networks was engineered by British commercial policies like the "imperialism of free trade" or the development of transport and communications infrastructure over its territories (Booth, 2007a). Nevertheless, the managers of those networks were local merchants, specially Chinese, who exploited their personal connections in the region. Both issues are reflected in Figure 3.4 where there is a positive relationship between kilometers of railway constructed on the region, number of Chinese at transit entrepôts and total imports passing through them during the period of transit expansion.

Figure 3.4: Kilometers of Railway at the region, ethnic Chinese Population in Transit Ports (right axis) and Regional Transit trade (left) (1871-1938).

a) Kilometers of railway and Transit *b) Ethnic Chinese and Transit*



Sources: See text.

3.3.3. Network Consolidation: Trade Inside and Trade Between Empires

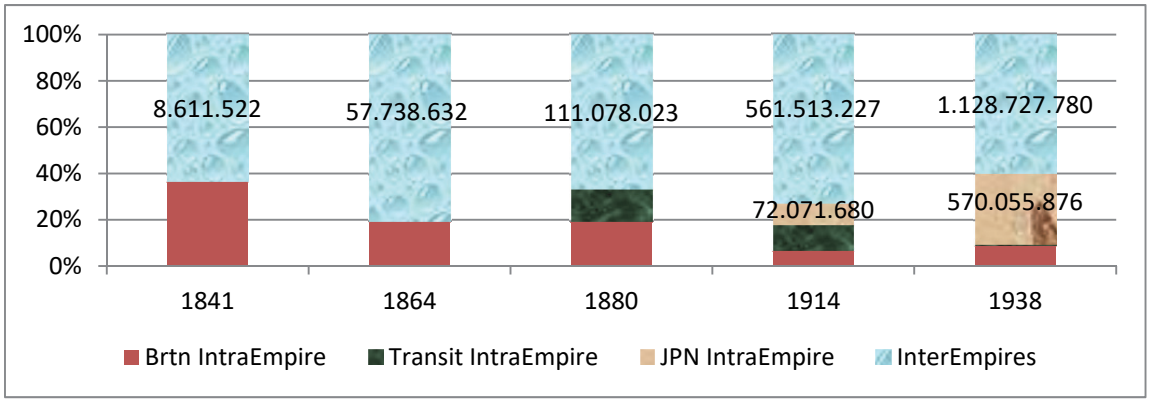
Apart from the exploitation of British entrepôts, empires facilitated regional trade by many different channels. On this subsection, we explore the imperial composition of regional imports and theorize that regional integration was consolidated thanks to trade within empires, specially the Japanese during the interwar years.

In that sense, figure 3.5 is showing the distribution of regional imports for some benchmark years, differentiating between intra-empire trade or trade between territories sharing a colonizer (Transit, Other British and Japanese) and commerce between territories belonging to different empires including neutral territories (inter empires). What can be observed is that intra-empire trade was dominated by the British until Japanese irruption during WWI, although most regional trade (between 60% and 80%) took place between territories belonging to different empires. One should realize, however, that data employed doesn't record trade between the different territories conforming British Malaya or between Burma and India. Accounting for those flows will for sure increase British intra-empire

relevance since for example, 50% of Burma's imports (around 15 million dollars) came from India during 1937-38.

Nevertheless, the most appreciable feature of this graph is that the two biggest waves incrementing regional imports were characterized by raises on intra-empire trade: The 1864-1880 escalation is explained by the already known expansion of transit trade while the 1914-1938 regionalization was possible thanks to Japanese intra-empire which substituted the British. This imperial expansion was bound to Japan's industrialization which transformed it into the region's commercial leader, jumping from representing a 0.5% of region's imports in 1859 (right after the end of isolation) to a 20% after conquering Taiwan and Korea (1896-1905) and a 30% during WWI, parallel to a big raise in GDP per capita which tripled the Chinese one in the 1930s despite of starting at similar levels in the 1850s (Bernhofen & Brown, 2004; Kakahiro & Gotaro, 1929, pp. 3-9). In that aspect, the reforms introduced by the Meiji regime after 1868 seem to explain Japanese takeoff with respect to China (Ma, 2004). See Appendix A for further inquiries about Japan's leadership.

Figure 3.5: Distribution of Regional Imports within and Between Empires (1840-1938) .



Sources: See Text.

3.4. Model

Previous sections have suggested that East and Southeast Asia territories were Natural Trading Partners and have reviewed the theoretical and historical reasons behind this fact. To statistically check this hypothesis and determine the strength of different determinants we have employed a Gravity Model in which each country "i" imports from each partner "j" in every period "t" depend positively on economic size represented by the

sum between GDP of the importer and GDP of the partner (Egger, 2002).[15] They also depend negatively on trade costs ($TC_{ij,t}$) with country partners as equation 3.1 shows.[16] Trade costs in that equation are represented by the distance between countries and by their average levels of tariff protection.

In order to check the first hypothesis, we have created some dummies to uncover the existence of commercial networks and measuring their intensity. The key one is $Region_{ij,t}$ which takes value 1 when the trade partner comes from East and Southeast Asia and a positive and significant coefficient would show that regional trade was higher than what gravity forces might predict, thus labeling East and Southeast Asia countries as Natural Trading Partners. Then, $Colony_{ij,t}$ shows whether a certain trading partner is the colonizer or a colony of the reporting one, $EUROPE_{ij,t}$ equals 1 when the partner is a European country and finally $Shared\ Colonizer_{ij,t}$ accounts for trade between territories colonized by the same imperial power. In the end, we have an unbalanced panel estimated with importer country (β_i) and time (β_t) fixed effects for better control multilateral resistance (Redding & Venables, 2004). The dependent and continuous independent variables are going to be logged so coefficients can be interpreted as elasticities (Lye & Hirschberg, 2002).[17] The whole sample can be then divided into other subsamples to determine how the direction and significance of trade biases evolve through different periods.

$$Imports_{ij,t} = \beta_0 + \beta_1 GDP_{ij,t} + \beta_2 TC_{ij,t} + \beta_3 Region_{ij,t} + \beta_4\, Colony_{ij,t} + \beta_5 EUROPE_{ij,t} + \beta_6 Shared\ Colonizer_{ij,t} + \beta_i + \beta_t \qquad \text{(EQ 3.1)}$$

The second hypothesis deals with the determinants of regional intensity, so our new dependent variable will be imports from regional partners. [18] The model will be quite similar to the one shown in equation 3.1, with the incorporation of additional trade cost variables like the evolution of the nominal exchange rate between the importer country and

[15] We employ this sum instead of separate GDPs and follow the same procedure for the rest of bilateral variables so we avoid that the number of variables duplicate.

[16] Another proxy for market size could be total population who might capture raises on demand of rice, extensively traded inside East and Southeast Asia. Nevertheless, the inclusion of this variable has not changed the results since we still find a positive and significant coefficient for regional trade. See Appendix A.

[17] A 1% increase on a continuous variable will be associated to a β% increase on imports. For the case of dummies imports will be a $((e^{\beta} - 1) * 100)$% higher between countries sharing certain characteristics compared with other not sharing them.

[18] A test for serial correlation has been performed at both panels and results show autocorrelation on equation 1. The good news is that the estimation assuming autocorrelation gives similar results as the ones offered on this paper, offering an even higher coefficient for regional integration. See appendix A

each of its partners (1913=1) or average maritime freight factors for shipments between countries inside the region. This last variable tries to see if maritime transport costs are more relevant than general costs, which would point that access to the sea by every country is a relevant driver of the regional character of East and Southeast Asian imports. General transport costs are represented by distance and tariffs are included as on Equation 3.1 for illustrating non-transport trade costs.[19]

In this case the model tries to determine whether economic or historical variables were more relevant on the determination of intra-regional trade. On the side of economic determinants there are differences on demand structure approximated by the absolute difference in GDP per capita between the importer and each trading partner or differences in factor endowments proxied by absolute differences in population density. On the other hand, we have historical explanations like commercial infrastructure available, measured by the sum of railways kilometers on both countries. We also incorporate two complementary variables for measuring the influence of local merchants and migrant workers: the first one employs the sum of ethnic Chinese living every year on both the importer and the partner country and tries to measure the specific influence of Chinese workers on regional trade ($ChinaMigrants$).[20] Among them there was an important number of Chinese merchants who interacted with other local communities like Indian and Malay in order to foster regional connections. We believe that the role of those local merchants is better reflected by linguistic ties than by migratory flows and that's why we've created a dummy (LOCALLANGUAGE) which is equal 1 in case two territories speak a common Asian language, excluding those speaking English whose role will be analyzed by variables presented below. They will check for British imperial networks either through trade between British colonies ($British\ IntraEmpire_{ij,t}$) or through Transit trade ($TRANSIT_{ij,t}$) and the influence of the Japanese Empire either through trade with its colonies($JPNINTRAEMPIRE_{ij,t}$) or with the rest of the region ($JPNREGION_{ij,t}$). The

[19] The existence of land borders is another variable commonly employed by the literature to represent trade costs. Nevertheless, most East and Southeast Asia trade was performed by sea so land borders are not binding in this case. In fact this variable has a positive sign on regressions performed which doesn't make economic sense and that's why this variable is not included in the present regression.

[20] We aware of the many concerns regarding the use of a gross variable like that. Nevertheless, we also tried to use the share of ethnic Chinese over total population or an index measuring the evolution of the stock of Chinese and regression coefficients don't almost change.

estimated model on this second section is shown in equation 3.2 and it will be also estimated through panel estimation with fixed effects.[21]

$$Regional\ Imports_{ij,t} = \beta_0 + \beta_1 GDP_{ij,t} + \beta_2 TC_{ij,t} + \beta_3 Economic\ diff_{\ ij,t} + \beta_4 Infrastructure_{\ ij,t} + \beta_5 ChinaMigrants_{\ ij,t} + \beta_6 BritishPower + \beta_7 JapanPower_{ij,t_{ij,t}} + \beta_i + \beta_j + \beta_t \qquad \text{(EQ 3.2)}$$

3.5. Data

3.5.1. Imports Data.

To measure the degree of regional integration in East and Southeast Asia, we are going to study the evolution of imports coming from regional neighbors and compare them with imports having their origin outside Asia. There was an option for studying also the evolution of bilateral regional exports, but we believe Customs information regarding country of origin is more accurate for imports than for exports flows since custom officials were more interested in the geographical origin of imports for fiscal purposes. (Federico & Tena, 1991).

The database includes imports for 13 countries in East and Southeast Asia disaggregated by partner country.[22] For the purpose of the present research it is very important to maintain a consistent accounting for the origin of transit trade and for that reason A&T database presented on chapter 1 will be utilized instead of the mixture between A&T and Ricardo employed previously.

For this analysis we have divided the whole sample (1840-1938) into different sub-periods to make a more thorough analysis. The subsamples chosen respond to the number of countries for which imports data becomes available; during 1840-1863 there are only 4 countries with complete information, which become 8 in 1864-1879 and 12 during 1880-1913 and 1914-1938, which are however divided in order to measure changes during and after the First World War.

[21] The employment of only regional partners permits us to also incorporate partners fixed effects without losing degrees of freedom.

[22] The countries are: Japan, Indonesia, India, Philippines, Sri Lanka, French Indochina, China, Siam, Korea, Taiwan, Myanmar, British Malaya and British Borneo.

3.5.2. Gravity and economic determinants

The first objective of the Gravity Model construction is to see whether trade inside the region was more intense than what total GDP and distance among countries may indicate, so we need to obtain information about both variables. Distance variable refers to Great Circle distance between the closest ports of a determined pair of countries.[23] Then, we obtain information about the importer and country partners' GDPs, which will measure market size. The principal source has been (Maddison Project, 2014) which collects GDP information in 1990 GK Dollars for many countries.[24] For the estimation of missing flows, see Appendix A.

Differences in demand structure are proxied by the absolute value of differences in GDP per capita between partners. Data on GDP is divided by the total population found also in Maddison to calculate this variable. Finally, we measure differences in population density (in absolute value also) between regional partners by dividing the total population by the extension in square kilometers, with the purpose of representing differences in factor endowments.

3.5.3. Trade Costs variables.

Apart from distance, we incorporate three additional variables reflecting trade costs between partners. The first one refers to bilateral nominal exchange rates between currencies. They are expressed as units of foreign currency per unit of the local currency, so increments on the variable reflect an appreciation of local currency relative to the foreign one (Federico & Tena, 2018). This variable is normalized through the creation of a scale (1913=1) to reflect its evolution. Secondly, we measure the evolution of freight factors indices for several routes as a specific measure for maritime costs which are believed to be specially relevant on this archipelagic region. They are obtained from (Isserlis, 1938) and complemented with (Federico & Tena, 2018) when necessary.[25] Finally, levels of average tariff protection come from (Blatman et al., 2003).

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[23] It is measured on nautical miles and obtained from https://www.distancefromto.net/.

[24] One must be careful when using Maddison estimates for Asia. (Bassinoand Van der Eng, 2016) show that the use of historical PPPs rather than Maddison one based on 1990 GK dollars yield higher GDP for Asian countries relative to Japan in 1913. In any case we have also tried to measure size with alternative indicators like population and results hold very much the same.

[25] We assume territories inside a route to share the same index (1913=100). The chosen routes cover the whole region: East Asia-East Asia, East Asia-Southeast Asia, East Asia-South Asia, Southeast Asia-Southeast Asia, Southeast Asia-South Asia, South Asia-South Asia.

3.5.4. Power, migration network and infrastructure variables.

To capture other relevant trade costs, we incorporate new variables that we believe are key for our study. First of all, we build a set of dummy variables that permit us to check whether regional trade, imports from the colonizer, imports from Europe, imports from countries sharing the same colonizer or transit imports are higher than what distance and economic size would predict. Those dummies are going to be a first approximation to Western colonizers and European power. We also create dummies accounting for the Japanese influence, both through its direct trade with its colonies and through exchanges with other Asian territories. We consider, as previously mentioned, imperial networks benefited from the construction of transport infrastructure and the connections of local merchants. For that reason, we have decided to include total railway kilometers as a variable which approximates the development of land transport infrastructure in every country in the region. The information has been obtained from (Mitchell, 2003).

To analyze the role played by migrants on regional trade in East and Southeast Asia, we measure on the one hand the role of Chinese workers (both merchants and wage-earners) and on the other the influence of local merchant networks, including also Indian and Malay. The last one assumes that a country whose people speak a certain language is more likely to hold communities of merchants speaking this same idiom as it is implicit on the literature connecting linguistic ties with migratory flows (Pytlikova & Adsera, 2010). Under this assumption we create a dummy which is equal 1 when two countries have a common Asian tongue (Chinese, Hindi or Malay, English is excluded since it was employed by European merchants, not local ones) among their commonly spoken languages found at (Melitz & Toubal, 2014).

The role of Chinese workers is analyzed through information on ethnic Chinese population at every country studied. We assume that this variable is problematic because the definition of Chinese population vary from source to source, but it is relatively stable and works well for approximating the influence of Chinese immigrants on regional trade networks in East and Southeast Asia. Information for Southeast Asian countries for benchmark years comes from (Purcell, 1966), based on census data and from estimates coming from secondary sources. The number of Chinese migrants living in India and Myanmar came from The India Census (1891-1911), and for the rest of territories, we have employed secondary sources (See Appendix A for further detail on sources).

3.6. Results

The first thing we appreciated on the descriptive statistics is that regional trade increased and surpassed foreign one during the studied period, suggesting that countries in East and Southeast Asia might be Natural Trading Partners. Our data also seems to the point that historical events were behind regional integration; early signs were appreciated after 1860 coinciding with the exploitation by Chinese merchants of transit and imperial networks created by the British. Regionalization consolidated after WWI in parallel with Japanese industrialization and empire building. We will try to confirm that presumption in the following section. Firstly the study of R^2 found on the following tables shows that our model explains around 40% of changes on total imports (almost 50% on regional ones) on the selected countries.[26]

3.6.1. General Results

The results would show that regional countries in our sample are trading more with their neighbors than what their total GDPs and distance might suggest (regional dummy significant), so East and Southeast Asia territories meet the second criteria to be considered Natural Trading Partners along with the whole series but with different intensity according to the period. [27]Following this, we observe the same three stages described on section 3: during the period 1840-1863 regional exchanges were not significant and trade was diverted towards the colonizers. Diversion continued in the second stage where imports from other European territories and colonial fellows outside Asia became notable, although we can also appreciate the first traces of regional integration which was culminated on the third stage (1880-1938).

Across the paper, we've argued that empires were decisive on the origins of regionalization. The British created transit networks around Hong Kong and Singapore and their wide use by regional partners after 1860 triggered the first expansion of intra-regional trade. To check this, Table 3.2 analyses imports determinants excluding from the sample trade coming from Hong Kong and Singapore. Elimination of transit flows reduces the intensity of the regional network and most importantly, the regional dummy ceases to be

[26] Within and between R-squared coefficients are telling that the model for total imports represents better changes within countries while the regional one is superior explaining variance between countries.

[27] The overall coefficient of Regional dummy suggests that East and Southeast Asian countries trade a 346% more with regional partners than with the rest of countries. This effect is substantially higher to the one found for Western Europe by the same author on a working paper which also shows an insignificant regional integration for Latin America on the same period.

significant on the period 1864-1879, confirming that transit trade was behind this first regional wave in the second half of the 19th century and also facilitated regional trade until WWII.

Table 3.1: Overall imports determinants 1840-1938 (Transit trade included).

VARIABLES	(1) Whole Sample	(2) 1840-1863 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1914-1938 Sample
GDP	0.789***	0.744***	0.418***	0.651***	1.087***
	(0.0199)	(0.122)	(0.0703)	(0.0266)	(0.0338)
DISTANCE	-0.630***	-0.858***	-0.624***	-0.612***	-0.580***
	(0.0241)	(0.134)	(0.0768)	(0.0351)	(0.0382)
TARIFFS	-0.284***	-0.776	-0.726*	0.156*	-0.538***
	(0.0498)	(1.424)	(0.388)	(0.0932)	(0.0882)
REGIONAL	1.495***	0.372	0.604***	1.283***	2.124***
	(0.0517)	(0.255)	(0.173)	(0.0736)	(0.0814)
COLONY	3.593***	4.815***	3.998***	3.446***	3.190***
	(0.100)	(0.346)	(0.329)	(0.150)	(0.162)
EUROPE	0.675***	0.0218	0.726***	0.899***	0.556***
	(0.0480)	(0.241)	(0.181)	(0.0706)	(0.0718)
SHAREDCOLONIZER	0.434***	0.0325	0.682***	0.238**	0.768***
	(0.0702)	(0.225)	(0.203)	(0.102)	(0.122)
Constant	7.065***	10.72***	4.551***	7.540***	5.400***
	(0.269)	(3.099)	(1.726)	(0.326)	(0.648)
Observations	16,358	838	1,348	6,863	7,315
R-squared	0.380	0.296	0.307	0.392	0.437
Number of YEAR	99	24	16	34	25

Robust standard errors in parentheses. Time and country fixed effects included but not displayed.

*** p<0.01, ** p<0.05, * p<0.1

Regarding the rest of the variables, we can see that gravity variable works in an expected way; imports coming from countries presenting bigger GDP are higher and raises on trade costs (distance and tariffs) generally reduced imports. During the overall period we can see that a 1% increase on country pair GDP leads to a 0.789% increment on imports, a coefficient which is close to the 0.8-1.2% interval considered normal (Carrere, 2006). The coefficient obtained for distance also lies inside values obtained by related researches (-0.4 and -0.7), although we acknowledge that this coefficient is affected by the inclusion of other trade costs like Tariffs (Frankel et al, 1997, pp.62-63; Sohn, 2005). After discovering the origins and intensity of regionalization we are going to contrast the relevance of its theoretical and historical determinants.

Table 3.2: Total imports determinants 1840-1938 (Transit trade not included).

VARIABLES	(1) Whole Sample	(2) 1840-1863 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1914-1938 Sample
GDP	1.053***	0.900***	0.581***	0.954***	1.303***
	(0.0248)	(0.133)	(0.0858)	(0.0350)	(0.0406)
DISTANCE	-0.605***	-0.735***	-0.793***	-0.503***	-0.657***
	(0.0441)	(0.154)	(0.167)	(0.0661)	(0.0677)
TARIFFS	-0.0836	-0.631	-0.710	0.283**	-0.389***
	(0.0576)	(1.518)	(0.450)	(0.111)	(0.0994)
REGIONAL	1.186***	0.411	-0.239	0.985***	1.800***
	(0.0811)	(0.267)	(0.300)	(0.121)	(0.127)
COLONY	3.502***	4.987***	4.215***	3.341***	3.000***
	(0.104)	(0.358)	(0.348)	(0.157)	(0.167)
EUROPE	0.459***	-0.158	-0.00312	0.737***	0.403***
	(0.0570)	(0.253)	(0.231)	(0.0876)	(0.0832)
SHAREDMETROPOLI	0.660***	0.0454	0.594***	0.681***	0.855***
	(0.0768)	(0.228)	(0.224)	(0.114)	(0.132)
Constant	1.946***	7.655**	13.37***	1.417**	3.028***
	(0.507)	(3.431)	(1.736)	(0.692)	(0.935)
Observations	12,943	812	1,035	5,179	5,960
R-squared	0.383	0.300	0.224	0.381	0.445
Number of YEAR	99	24	16	34	25

Robust standard errors in parentheses. Time and country fixed effects included but not displayed.

*** p<0.01, ** p<0.05, * p<0.1

Column 1 on Table 3.3 is showing that both kinds of determinants favored regional trade during the analyzed period. On the one hand, low distances between territories and structural demand differences encouraged East and Southeast countries to become Natural Trading Partners, although maritime freight factors seem to be insignificant, indicating that the region's archipelagic character didn't facilitate regional imports. These results would align with the theories of Krugman or Schiff rather than with Linder or Hecksher-Ohlin hypothesis, since differences in factor endowments undermined regional imports. Nevertheless, coefficients of historical variables like "imperial networks" show a much bigger impact on the establishment of special commercial relationships inside the region. This could mean that imperial policies contributed to intra-regional specialization and the consequent demand differences, something that will be checked on the following chapter.

The temporal disaggregation practiced on columns 2-5 confirms that British imperial direct and transit networks were behind the origins of integration (column 3)

supported by Chinese workers and investment on railway infrastructure.[28] This is complemented with the insignificance of trade costs (only tariffs harmed imports) and the negative coefficient of demand complementarities. Later, after WWI, British relevance decreased and regionalization was consolidated through the Japanese colonial networks and their informal connections with the rest of the region (columns 4 and 5).[29] The reduced strength of the British Empire with the entrance of the 20th century is in line with (Jacks et al.,2020) which also finds a reduced significance of distance coefficient in this period.

Moreover, overall results in column 1 demonstrate that the Japanese role was more relevant than the British one in the determination of regional imports during the studied century. This evidence could support those theories about superior impact and positive legacy of the Japanese Empire on the development of conquered territories (Kohli, 1994), although more recent literature suggests that Japan wasn't different to European Empires which prioritized their own benefit and missed a good opportunity for further developing conquered territories (Booth, 2007a). In that aspect, the hypothetical use of colonies to expand Japan's industrial base could be the real progenitor of demand complementarities demonstrated below, potentially explaining the superior coefficient presented by its colonial networks.

Such debate will be addressed on the last two chapters of the thesis were we will also explain the relevance that the construction of the South Manchurian railway had on this process as derived from the high coefficient found on railway during interwar years (column 5). Japanese supremacy was also supported by Chinese and other local merchants, although on a lower extent compared with the period of British dominion. The rest of the variables behaved as usual with economic size attracting regional imports, currency appreciation facilitated imports, especially during years of Silver devaluation (Column 4) and tariffs were not generally significant because most territories were influenced by the British low tariff policies.

All in all, coefficients presented in column 1 suggest that historical variables like imperial networks exercised a stronger impact in East and Southeast Asia special trading relationships than economic determinants like demand complementarities, whose positive

[28]A parallel study has shown that the influence of Chinese diaspora was stronger on Southeast Asia than on the rest of the region.

[29] Prior to 1896 the Japanese Empire was reduced to Japan mainland, so variables representing formal and informal imperial networks are exhausted by country fixed effects during 1840-1879.

coefficient indicate that those territories met the third criteria to be considered Natural Trading Partners.

Nevertheless, we are putting together a Dummy and a continuous variable whose coefficients are not comparable. To determine which variable played a bigger role, we have constructed two different kinds of counterfactuals. In both cases, the absence of imperial networks would generate higher reductions on regional imports than lack of demand complementarities: On the first one, total regional imports in 1938 would have been 79% lower than they were in reality in case no imperial networks were ever created (we assume that each country's total imports evolve at the same path as average imports from countries with which it doesn't share colonial ties), whereas they would have been 71% lower in case there were no demand complementarities (each country's imports are assumed to evolve at the same rhythm as those from a set of countries whose GDP per capita doesn't double the reporter's one). The contrast is more evident under the second counterfactual in which rather than basing our estimates on sets of countries, we employ imports from an independent country like Thailand for illustrating the absence of empires and imports from the partner presenting the most similar GDP per capita for computing trade in the absence of demand complementarities. Once more, absence of empires reduced total imports a 29% and lack of demand complementarities reduced imports by just a 9%. Full explanations of these estimations are found on Appendix A.

Table 3.3: Regional and Southeast Asia imports determinants 1840-1938.

	VARIABLES	(1) Whole Sample	(2) 1840-1863 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1914-1938 Sample
SIZE	GDP	0.572***	4.907	1.253***	0.512***	0.276**
		(0.0342)	(34.57)	(0.308)	(0.0426)	(0.126)
TRADE COSTS	DISTANCE	-0.293***	21.37	-0.727	-0.581***	-0.254***
		(0.0538)	(36.92)	(0.794)	(0.0876)	(0.0540)
	MARITIME FREIGHTS	0.124	-0.937	0.131	-0.0397	-0.300***
		(0.0793)	(0.959)	(0.697)	(0.227)	(0.0881)
	EXCHRATE	0.398***	0.384	-0.0164	0.473***	0.302***
		(0.0604)	(1.595)	(0.229)	(0.152)	(0.0449)
	TARIFFS	-0.0587	6.895***	-1.326**	-0.226	-0.0893
		(0.0659)	(1.778)	(0.609)	(0.150)	(0.114)
ECON DIFF	DEMANDSTRUCTURE	0.156***	-2.073**	-0.604**	0.0832***	0.253***
		(0.0232)	(0.836)	(0.308)	(0.0250)	(0.0278)
	FACTORENDOWMENTS	-0.144***	-2.473	0.0646	-0.168***	-0.220***
		(0.0176)	(8.143)	(0.0988)	(0.0441)	(0.0434)
INFRASTRUCTURE	RAILWAY	0.287***	2.896**	0.555***	0.295***	0.841***
		(0.0263)	(1.233)	(0.151)	(0.0335)	(0.0947)
LOCAL NETWORKS	LOCALLANGUAGE	0.664***	35.16	1.038	0.620***	0.390***
		(0.0807)	(62.36)	(1.344)	(0.141)	(0.0736)
	CHINAMIGRANTS	0.0595***	0.305	0.397***	0.0562***	0.0785***
		(0.0132)	(3.127)	(0.106)	(0.0150)	(0.0151)
BRITISH IMPERIAL NETWORKS	BRITISH INTRAEMPIRE	1.208***	18.25	5.499***	1.155***	0.551***
		(0.131)	(15.12)	(0.363)	(0.162)	(0.0971)
	TRANSIT	2.088***		6.595***	2.867***	1.542***
		(0.134)		(0.806)	(0.250)	(0.213)
JAPAN IMPERIAL NETWORKS	JPNREGION	0.564***			0.975***	1.084***
		(0.0837)			(0.147)	(0.105)
	JPNINTRAEMPIRE	2.680***			1.887***	3.742***
		(0.197)			(0.163)	(0.230)
	Constant	4.637***	-236.0	-3.955	7.944***	4.955***
		(0.540)	(330.1)	(5.374)	(1.067)	(0.720)
	R-Squared	0.464	0.9313	0.7433	0.4984	0.5718
	Observations	4,487	60	262	2,009	2,156
	Number of YEAR	86	11	16	34	25

Robust standard errors in parentheses. Time and country fixed effects included but not displayed.

*** p<0.01, ** p<0.05, * p<0.1

3.6.2. Robustness Checks

The previous section has provided a set of results that confirm the main hypothesis of this paper like the existence of natural trading relationships in East and Southeast Asia that were mostly explained by imperial networks and investments along with the role of local merchants. Nevertheless, those results correspond to a specific model containing certain econometric caveats that should be addressed. The first one deals with multilateral

resistance to trade since the inclusion of fixed effects is not enough for controlling it. A first reason is that importer and exporter fixed effects must be time varying and in order to do that we are going to interact them with time fixed effects on the first column of table 3.4 (Yang & Martínez-Zarzoso, 2014). However, there is still a set of authors claiming that multilateral resistance is only controlled after incorporating structural characteristics (Anderson & Van Wincoop, 2003), so we reconcile those approaches in column 2 by estimating the model by PPML but incorporating country and time fixed effects (Fally, 2015).

Another methodological concern we have to address is the treatment of zero trade flows. As explained before, the impossibility of determining if a flow was really zero or unknown forced us to not include them. Anyway, the belief that those flows can provide interesting information persuaded us to include them on the PPML estimation due to method's suitability (Santos Silva & Tenreyro, 2006). Nevertheless, we appreciate a possible excess of zeros, since they represent more than half total flows. For that reason, in column 3 we show the results estimating the model by Zero-inflated Poisson (ZIP) in order to solve this problem (Martin & Pham, 2015).

What can be appreciated is that results obtained on section 6.1 still hold under these new specifications: GDP attracts imports, trade costs generally undermine them and demand differences favored regional trade, although on a lower extent than imperial networks (the only exceptions are British non-transit networks that become negative in column 2). Finally, investments in railway infrastructure and the diaspora of local merchants positively attracted regional trade although they are less significant.[30]

Nevertheless, it could be the case that changes in sample composition might be the true drivers of results appreciated in table 3.3. To demonstrate that the incorporation of six new countries (including Japan and its newly created empire) to the sample doesn't affect the main conclusions of the paper, table 3.5 shows results keeping the same seven-country sample for the whole period.[31] Results show that our main conclusions are not driven by

[30] On appendix A we also control for multilateral resistance on the equation studying total trade determinants and results are maintained, reasserting the special intra-regional trade intensity enjoyed by East and Southeast Asia partners.

[31] The regression is done using the seven countries included on the 1864-1879 sample for every period. We could use the four countries available on 1840-1863 but they are not representative of total region's imports since they only account for 22% of the total, whereas the chosen sample is responsible for 66% of total regional imports.

changes in the sample after 1864. Economic determinants still had a much lower influence than imperial policies, which are the main attractor of regional trade. Transit and British networks were the main engines of early modern regionalization, supported by local merchants (specially the Chinese whose coefficients increase under this new specification) and investment in infrastructure. Afterwards, the British lost ground due to the advance of Japanese networks.

Table 3.4: Regional imports determinants under different estimation methods (1840-1938)

VARIABLES	(1) Country and Time FE interaction	(2) PPML FE	(3) ZIP
GDP	0.512***	0.630***	0.0413***
	(0.0495)	(0.0692)	(0.00652)
DISTANCE	-0.291***	-0.669***	-0.0415***
	(0.0545)	(0.0348)	(0.00643)
MARITIME FREIGHTS	0.141*	-0.0704	0.00386
	(0.0811)	(0.0629)	(0.00945)
EXCHRATE	0.354***	0.274***	0.0392***
	(0.0881)	(0.0631)	(0.00937)
TARIFFS	-2.295	-0.185***	-0.00376
	(5.964)	(0.0615)	(0.0102)
DIFF DEMANDSTRUCTURE	0.191***	0.285***	0.00315
	(0.0300)	(0.0423)	(0.00382)
DIFF FACTORENDOWMENTS	-0.208***	-0.230***	-0.0136***
	(0.0285)	(0.0199)	(0.00373)
RAILWAY	0.405***	0.539***	0.0188***
	(0.0428)	(0.0595)	(0.00520)
LOCALLANGUAGE	0.632***	-0.101	0.00150
	(0.102)	(0.0766)	(0.0111)
CHINAMIGRANTS	0.0733***	-0.00727	0.00424**
	(0.0148)	(0.0143)	(0.00207)
BRITISH INTRAEMPIRE	1.111***	-0.504***	0.0863***
	(0.123)	(0.119)	(0.0163)
TRANSIT	2.374***	1.207***	0.168***
	(0.123)	(0.0983)	(0.0163)
JPNREGION	0.610***	1.016***	0.0719***
	(0.110)	(0.0889)	(0.0148)
JPNINTRAEMPIRE	2.373***	2.040***	0.206***
	(0.184)	(0.128)	(0.0250)
Constant	9.131	8.056***	2.208***
	(11.71)	(1.067)	(0.0924)
Observations	4,487	9,952	4,492
R-squared	0.5741	0.516	
Number of YEAR	86		

Robust standard errors in parentheses. Time and country fixed effects and their interactions are included but not displayed in column 1.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.5: Results using the same sample for every period.

VARIABLES	(1) Whole Sample	(2) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1913-1938 Sample
GDP	0.708***	1.253***	0.373***	-0.913***
	(0.0404)	(0.308)	(0.0562)	(0.152)
DISTANCE	-0.240***	-0.727	-0.657***	-0.428***
	(0.0632)	(0.794)	(0.0725)	(0.0757)
MARITIME FREIGHTS	0.126*	0.131	0.0748	-0.285**
	(0.0707)	(0.697)	(0.253)	(0.111)
EXCHRATE	0.405***	-0.0164	0.490***	0.356***
	(0.0621)	(0.229)	(0.171)	(0.0301)
TARIFFS	0.226***	-1.326**	-0.331**	-0.0912
	(0.0778)	(0.609)	(0.162)	(0.102)
DEMANDSTRUCTURE	0.214***	-0.604**	0.0716**	0.319***
	(0.0204)	(0.308)	(0.0284)	(0.0347)
FACTORENDOWMENTS	-0.268***	0.0646	-0.226***	-0.183***
	(0.0305)	(0.0988)	(0.0459)	(0.0338)
RAILWAY	0.181***	0.555***	0.336***	1.777***
	(0.0236)	(0.151)	(0.0390)	(0.123)
LOCALLANGUAGE	0.270***	1.038	0.543***	0.806***
	(0.0858)	(1.344)	(0.132)	(0.132)
CHINAMIGRANTS	-0.000942	0.397***	0.118***	0.220***
	(0.0153)	(0.106)	(0.0184)	(0.0155)
SHAREDMETROPOLI	1.406***	5.499***	1.663***	0.190
	(0.149)	(0.363)	(0.181)	(0.162)
TRANSIT	2.408***	6.595***	2.923***	0.678***
	(0.183)	(0.806)	(0.334)	(0.159)
JAPANESEEMPIRE	0.119		1.390***	1.918***
	(0.0877)		(0.134)	(0.125)
Constant	2.245***		2.299***	6.097***
	(0.214)		(0.190)	(0.403)
Observations	4487	262	1650	1709
R-Squared	0.5081	0.7433	0.4423	0.5397
Number of YEAR	86	16	34	25

Robust standard errors in parentheses. Time and country fixed effects included but not displayed.

*** p<0.01, ** p<0.05, * p<0.1

Finally, a frequent problem of these kinds of historical Gravity Models is that of the presence of endogeneity and the models constructed in the present paper hardly escape from it. In fact, many variables could suffer from reverse causation since the amount of regional imports could be influencing the kilometers of railway constructed at certain territory or Chinese migration looking for economic prosperity. For that reason, in order to avoid this problem we are going to lag every continuous independent variable because current imports cannot affect previous levels of the rest of controls. In this process, we must acknowledge that migration data is based on census published every ten years, while annual data is interpolated. That's why lags of migration variable are 10 years wide.

Table 3.6: Determinants of Regional imports using lagged independent variables.

VARIABLES	(1) Regional Imports
GDP	-0.0266
	(0.0417)
DISTANCE	-0.0186
	(0.0296)
MARITIME FREIGHTS	-0.0568
	(0.0493)
EXCHRATE	0.290***
	(0.0706)
TARIFFS	-0.112
	(0.0734)
DIFF DEMANDSTRUCTURE	-0.0496*
	(0.0283)
DIFF FACTORENDOWMENTS	0.0241
	(0.0170)
RAILWAY	-0.0865**
	(0.0348)
LOCALLANGUAGE	0.907***
	(0.0713)
LAG10MIGRANTS	0.0387***
	(0.0128)
BRITISH INTRAEMPIRE	1.158***
	(0.123)
TRANSIT	0.767***
	(0.124)
JPNREGION	0.498***
	(0.0753)
JPNINTRAEMPIRE	3.014***
	(0.217)
Constant	13.06***
	(0.581)
Observations	4,477
R-Squared	0.4136
Number of YEAR	89

Robust standard errors in parentheses. Time and country fixed effects included but not displayed.

*** p<0.01, ** p<0.05, * p<0.1

All in all, the main conclusions reached before still apply after taking lags of continuous explanatory variables. Local merchant's activities interacted with imperial networks in order to favor the expansion of regional imports, while in this case traditional economic factors fail to explain East and Southeast Asia commercial integration. This reinforces our claims regarding the special importance of historical factors explaining special trade relationships between countries and even influencing economic specialization patterns.

3.7. Conclusions

On these days in which prospects of future economic integration in East and Southeast Asia are being debated, this chapter surveys the possibility that those territories

are Natural Trading Partners conditioned by historical and institutional settings. Through the reconstruction of almost a century of bilateral imports in East and Southeast Asia, together with other relevant economic and trade cost variables, we can conclude that before WWII those territories met every criterion that according to this article grant the label of Natural Trading Partners. Following the existing literature, this phenomenon would enhance welfare effects generated by the subsequently established Free Trade Area and Customs Unions, so deepening regional integration would be positive for the economic development of East and Southeast Asia.

The reasons behind this regional commercial intensity respond to economic factors traditionally explained by the Natural Trading Partners' literature like GDP growth, reductions in trade costs or demand complementarities between territories. However, those features which are still present today, only complemented the effects of certain historical events which according to this research were the main characters of special trading relationships between territories and should be incorporated to the natural trading partner's debate. Regional trade during the British colonization period was already high as a remainder of regional networks created during the Age of commerce (15^{th}-17^{th} Centuries). Nonetheless, it was based on commodity trade between China and India and diverted outside the region as a first reaction to European conquest.

After that, the process of regional integration in East and Southeast Asia experienced a big push related with the colonization from the British Empire which by the 1860s got rid of economic characteristics of the region in order to consolidate a dense commercial infrastructure supported by European style institutions and organized around Singapore and Hong Kong entrepôts. This network was managed by Chinese merchants whose number expanded all over the region during the second half of the 19^{th} century and got rid of their commercial abilities and market knowledge. On a parallel way, the second half of the nineteenth century also saw an intensification of direct connections between British colonies confirming British supremacy on Southeast Asian regional integration.

Transit networks gained popularity until the entrance of the 20^{th} century when they started to shrink. However, the following period brought an intensification of regional trade, which was possible thanks to the Japanese imperial and industrial policies that strongly intensified trade between the mainland and its colonies, supported also by consolidated local networks. In fact, our results suggest that the overall influence of the Japanese Empire over East and Southeast Asian regional integration was bigger than the

British. This could either mean that Japanese developmental capacity was superior to that of European Empires or that the use of neighbor territories to support its own industrialization shaped the intra-regional specialization pattern exposed by the literature and demonstrated on this chapter. For that reason the last two chapters will deeply analyze the relationship between Japanese industrial and imperial expansions and the cooperation mechanisms between institutions leading the process.

All in all, this chapter conceptualizes the previously found special trading relationships between East and Southeast Asia partners, cataloguing them as Natural Trading Partners. In order to do that, we collect three different criteria that the literature presents as potential evidence confirming the existence of special trading relationships. This set of criteria means a good legacy since they can help future researchers in their quest to identify Natural Trading Partners. In addition, it adds evidence of the pivotal role played by certain historical events at the roots of special trade relationships between territories, which survive until nowadays supported by certain demand complementarities that were also influenced by historical institutional settings. This is demonstrated through the analysis of the commercial activity of empires and their interactions with merchants inside the region.

4 CHAPTER 3: TRADE IN THE SHADOW OF POWER: JAPANESE INDUSTRIAL EXPORTS IN THE INTERWAR YEARS

4.1. Introduction

The previous chapter has demonstrated the relevance that imperial activity had on the regionalization of East and Southeast Asia before the Second World War. Specifically, it has suggested that the raise of empires favored the industrialization of certain territories, favoring an intra-regional specialization that has maintained high levels of trade between neighbors until nowadays. Among the empires operating at the region, the Japanese was the most influential according to our results which leave an open debate regarding the true nature of that influence: was it developmental in nature? Or simply used its colonies to sustain its incipient industrialization?

On the present chapter we will demonstrate that Japanese newly created empire was very efficient in developing a peculiar imperial trade in the shadow of power throughout East and Southeast Asia in conjunction with a more aggressive imperial regional policy through conquest (Findlay and O'Rourke, 2007; Garfinkel. et al, 2012).[32] In order to do that, we will survey the links between Japanese imperial settings and its industrial expansion.

Of course, such protectionist and imperial policies in the international economy were not confined to Japan during the interwar years. Britain, for example, instituted a system of imperial preference with its colonies and mandated territories in the framework of the Commonwealth at the Ottawa Conference of 1932. Germany, having neither complete customs autonomy as a result of the Treaty of Versailles nor an informal or formal geographically contiguous empire, fostered a complex and oppressive system of clearing arrangements with Central European and Balkan neighbors even before the Nazi regime. Trade barriers rose all over the world, and the most prominent economies abandoned global multilateral free trade policies in favor of commercial exchanges within their empires. Fragmented regional or global empires, both formal and informal, were reconciled ambivalently with bilateral agreements that included tariffs, quotas, import licenses, exchange controls, barter and clearing agreements, and other protectionist policies.

[32] Trade has taken place in the shadow of power for all almost all of recorded human history. We argue that power matters for trade, as critically as the traditional determinants of endowments, preferences, and technology.

Japanese imperialist history is well known. During the Meiji Period (1868-1912), Japan annexed Ezo (Hokkaidô) in 1869, the Ryûkyû Islands in 1879, Taiwan in 1895, and Korea between 1905 and 1910. Until the 1920s, Japan allowed free access to foreigners in their occupied territories and only then created a real imperial bloc in conjunction with an escalation of domestic trade barriers. By the early 1930s, Japan already had consolidated a decisive policy of protectionism and an empire-wide regional market with trading privileges for Japanese industrial firms. Tariff policy in the Japanese occupied territories privileged Japan or was assimilated into Japan's tariff system. Korea adopted Japan's tariff system in 1923, as would Manchuria ten years later upon the territory's separation from the Chinese customs system, allowing preferential access for Japanese manufactures (Chase, 2005, pp. 62-64).

Along with the protectionist backlash experienced around the world, the development of the Japanese Imperial Bloc in the interwar years also responded to the demand of Zaibatsu heavy industrialists for exclusive access to broader markets and the military's desire to control vital strategic materials, such as oil, rubber, and iron ore. These interests were consolidated by the conquest of Manchuria as well as the regional expansion of commercial and investment networks in other areas later called 'The Greater East Asia Co-Prosperity Sphere'(Fletcher, 1989, pp. 144-50).[33]

This chapter will assess how much of the development of Japan's industrial exports during the interwar years was based on this combination of imperial soft power and its policy of aggressive conquest in East and Southeast Asia. Specifically, we examined whether the expansion of high-skill exports to Japan's neighbors can be better explained by improvements in productivity or by imperial policy variables. For that purpose, we ascertained the mechanisms that linked Japanese imperial activity to its exports. We defined the 'Japanese Empire' (JE) as including both previously occupied colonies and what we call 'Future Conquests'—those countries or polities in the region that was of strategic interest for Japan, as proven by their occupation between 1941 and 1945.[34] We argue that Japan exerted regional commercial influence through the creation of

[33] Similar to the term 'Third Reich', this was one of a number of slogans and concepts used in the justification of Japanese aggression in East Asia from the 1930s through the end of World War II.

[34] Formal colonies include: Taiwan, Korea, Kwantung Leased Territory, Manchuria (1932), and China (1938). The "Future Conquests" are: Manchuria (1912-1929), China (1912-1932), Thailand, Burma, French Indochina, Hong Kong, Dutch East Indies, British Borneo and Sarawak, New Guinea, British Malaya (including Singapore), the Philippine Islands, and the Solomon, Gilbert, and Marshall Islands in the Pacific. For more information on the main features of the colonies and future conquest territories, see Appendix B.

transnational business and investment networks and cultural diplomacy, which facilitated commercial information and created merchant community trust in the region. This soft power thrust, combined with a more traditional imperial policy of military conquest, was decisive for the consolidation of a new stage of industrial modernization during the 1930s.

To study the determinants of Japanese exports, we digitized Japanese commercial returns (Annual Returns of the Foreign Trade of the Empire of Japan) for several benchmark years (1912, 1915, 1925, 1929, 1932, and 1938) and created an exhaustive granular product data set of exports by country of destination for each of the chosen years. Using this data set, we analyzed the main determinants of Japanese exports by skill bias, focusing mainly in East and Southeast Asia, and comparing them with Japan's export performance with the rest of the world. The methodology employed for that purpose is in line with extensive and intensive marginal Gravity Models. The specification used in this paper includes the usual factor endowments, demand structure and trade cost variables (such as tariffs, transport cost, and political factors). The basic Gravity Model is augmented by a new series of freight factors from Japan to respective destinations (disaggregated by product line), commercial diplomacy appointments, and dependency relationships with Japan (occupation, annexation, colonization, and lease) before and after 1932.

Japan's second stage of industrial expansion in the interwar years was mainly based on exports of high-skill manufactured goods, and fostered by the imperial shadow of power. The literature in Japanese industrialization in the interwar years describes heavy industries' interests in gaining access to broader markets to increase economies of scale and reduce unit costs. There exists no quantitative evidence that proves the success of those mechanisms in expanding exports to regional markets. In this paper, we use a new data set and other empirical evidence to answer the following questions. First, were improvements in Japanese relative productivity or comparative advantage the main drivers of its industrial export expansion? Or, conversely, was trade expansion driven mainly by administrative enforcement related to imperial privileges? Our hypothesis, in short, is that the Imperial Bloc was a much stronger driver of Japanese export expansion than the conventional reduction of trade costs or improvements in relative productivity. Japan reacted to the interwar context of global commercial disintegration with aggressive import substitution and an imperial strategy to foster exports of manufactures, as did Britain and Germany in other ways.

4.2. Regional Trade and the Japanese Empire

What mechanisms link imperial expansion with increases in exports towards a determined region? Either international context or domestic industrial policy helps to understand the Japanese compound interest in East and Southeast Asia, and its expansionary policy of trade in the shadow of power (Garfinkel et al., 2012; Eichengreen & Irwin, 1995).

The British commercial relationship with its colonies after 1932, specially with India, with Britain turning away from almost a century of free trade policy, is probably the most well-known case study of the use of trade in the shadow of power. However, most of the literature presents the Commonwealth Trade Bloc as being less discriminatory towards outsiders than initially suggested by the text of the Ottawa Agreement of July 1932. Nevertheless, the alliance succeeded in implementing preferential access by Britain to the dominions and vice versa. Great Britain imposed a general tariff of 10% for manufacturers and other goods, increasing the empire's share of British imports by approximately 70% between 1930 and 1933 (De Bromhead et al., 2019). The British partially closed down Indian, African, and other imperial markets, into which some competitive Japanese textiles had expanded since the end of the 19th century. Indeed, the Manchurian invasion of 1931 preceded Ottawa, but this international context influenced Japanese expansionist commercial policy towards its empire during the 1930s nevertheless (Cain & Hopkins, 1980; Gallagher & Robinson, 1953)[35]

The Third Reich followed other practices emulating strategies of trade in the shadow of power during this period, and Germany consolidated its imperial ambitions in the Balkans and Central Europe during the Nazi regime. Germany used political enforcement on their neighbors to guarantee those primary and mineral resources necessary for geostrategic military considerations (Milward, 1981; Ritschl, 2001). During the 1930s, German trade facilitated bilateral clearing agreements, mainly signed with countries in Central and Southeastern Europe, but also in South America. Under this new regime, German acquisition credited against purchases by foreigners in German markets (Neal, 1979 ; Gross, 2016).

The case of Japanese imperial policy is peculiar not only because it predated World War I but also, most importantly, because it was advanced by a relatively poor developing

[35] (See discussion in Appendix B).

country and restricted to a regional framework (Matsusaka, 2007). In addition to its formal colonies, Japanese economic agents built a severe business and political networks with other countries in East and Southeast Asia. The motive behind this activity was mostly commercial as it will manifest in the subsequent military occupations, during the Second World War, of the vast majority of Southeast Asian territories.

The literature in Japanese colonialism had mainly focused on colonial trade links with Japan after occupation, although the literature also observed that the Japanese demonstrated their interest in Korean markets when they forced the opening of Korean ports and signed the unequal commercial treaties of 1876 (Kublin, 1952;Duus, 1998). After the occupation in 1905, colonial trade policy was directed by Tokyo to ensure the safe supply of foodstuffs and raw materials to Japan and to guarantee a market for Japanese manufacturers. This imperial policy industrialization after the global rise of protectionism following the Great Depression. Japan pursued growth with an empire-wide economic strategy. The annexation of Manchuria in 1931 and the adoption of an import substitution strategy signaled the beginning of Japanese planned industrialization within its colonies (Kohli, 1994). This strategy generated a significant increase in the production of high-skill manufactures, like steel for rail construction and machinery that was directed mainly towards the Japanese domestic market but was also exported to foster Korean industrialization (Chenery, et al., 1962).

Another mechanism granting Japanese exports access to its colonies was the fact that the Taiwanese and Korean economies were integrated with Japan by the removal of trade barriers and the introduction of fixed exchange rates. Additionally, Japan invested in the transport and communication infrastructure and imposed the assimilation of the Japanese language, which further reduced transaction costs. The commercial exchange was further facilitated by private sector investment and the establishment of Japanese companies (in fact, 97% of corporations in Korea were owned by Japanese) along with the opening of Japanese financial institutions like the Bank of Chosen (Aziz, 2012).

The above scenario is what happened in the better-known Japanese colonies. However, the Japanese Empire also included two other territories, which provide relevant examples. The most pertinent case was Manchuria, which became a Japanese puppet state in 1931, and was considered an additional Japanese colony. The Japanese had a presence in Manchuria before annexation, however, and this presence became more pronounced during the First World War. Japanese economic activity consisted mainly in the establishment of

large companies (such as banks, similar to the Bank of Chosen), of raising FDI flows, and of increasing Japanese private investment in transport infrastructure (aided by government subsidies). These activities permitted the Japanese to dodge most trade barriers and to reduce other transaction costs (Bix, 1972; Encarnation, 1999). Historiography suggests that Japanese investment before 1930 fostered Manchurian industrialization. After the annexation, the Japanese created in Manchuria a puppet state with the primary objective of influencing the direction and materials necessary for the rapid industrialization of the region (Kublin, 1959; Duus, 1998).

The second relevant case is that of the Kwantung Leased Territory, commonly presented as the most representative example of the 'conquest by railway' strategy. In 1906, after acquiring the territory during the Russo-Japanese War, the Japanese Government founded the South Manchurian Railway Company (SMR) to operate the railway network left by the Russians. By 1930 it had become the largest joint-stock company operating in the Japanese Empire. The company diversified in activities other than railway construction, but it remained a steady source of demand for Japanese goods like iron, machinery, and transport equipment used for mining, manufacturing, and railway construction (IYenaga, 1912).

The example of Manchuria illustrates the peculiar nature of the Japanese imperial shadow of power: a process in which Japan established economic links with neighboring territories as a demonstration of interest or announcement of future military occupation. We follow this historical case to justify the inclusion of a sample of countries and polities, prior occupation during WWII ('future conquest'), as part of Japan's informal empire. It is worth distinguishing between former European colonies and other territories. In the old case, Japanese investment was severely restricted by Europeans, whereas in the latter, Japanese investment diversification permitted an expansion of commercial relations.

China was the country in which Japan had stronger economic penetration. Japanese Zaibatsu (leading industrial conglomerates) and banks characterized Japan's presence and served to elude trade barriers and to reduce transaction costs (Howe, 1999; Osterhammel, 1986). The operation of Japanese economic interests was reflected not only in Japanese exports to China but also was related to Japanese military campaigns in its neighboring

country (which prefigured the origins of Japanese conflict with the USA and Great Britain).[36]

Furthermore, Japanese economic penetration took a different shape in those places where Japan could not invest, like British Malaya, the Dutch East Indies, or the Philippines. In these areas, Japanese activity was mainly characterized by aggressive marketing strategies that were possible due to precise knowledge of the cultural and geographic characteristics of these regional markets (Post & Lindblad, 1996). Japan developed efficient distribution channels for allocating Japanese products, taking advantage of good commercial relationships with local merchants. A final feature of Japan's economic links with Southeast Asia took the form of massive Japanese immigration to territories like the Philippines, with Japanese expatriates working in the trading sector, with the majority of these expatriates demanding Japanese goods (Shiraishi, 1993; Fisher, 1950; Koh Soo Jin & Tanaka, 1984).

The historiography suggests that Japanese geostrategic and economic concern initially contemplated a form of economic penetration by exports and investments in territories where its commercial opportunities would be later unequivocally confirmed by annexation during World War II. Our paper contributes to the literature of trade in the shadow of power by highlighting Japan's singularities and by providing an empirical demonstration of the success of the mechanisms linking the Japanese Empire with regional exports in East and Southeast Asia.

4.3. Empire and the Determinants of Japanese Exports

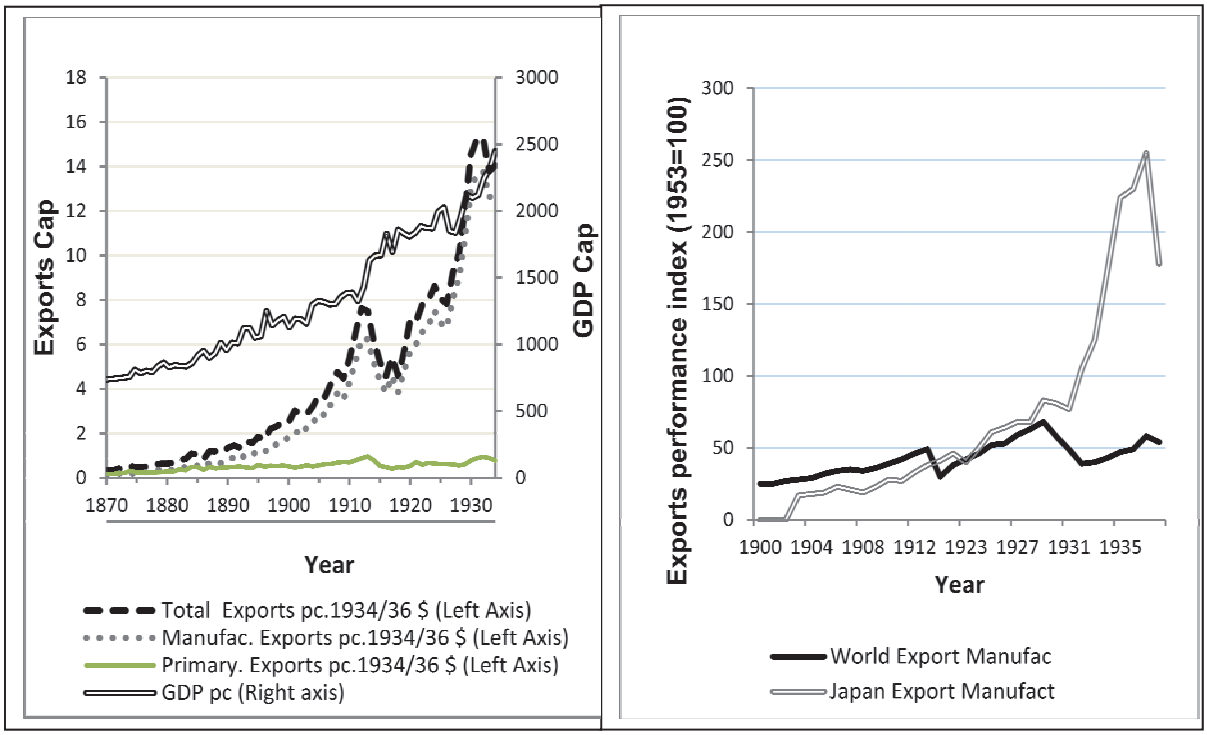
The late-19th and early-20th Centuries represented a continuation of the period of industrialization in Japan, which began in the 1850s after the forced opening of the ports by Western powers. This process permitted an essential expansion of Japanese GDP per capita, as is observed in Figure 4.1. The development of exports was an integral component of this remarkable economic growth, as manufacturing exports were one of the main drivers of such excellent comparative performance (Meissner & Tang, 2018).

The dynamic behavior of manufacturing exports contrasts with that of primary

[36] (He, 2007) mentions the complicity between Zaibatsu and the military power. (Howe, 1999)however, denies full agreement between both parties because although Japanese businessmen asked for diplomatic sanctions against China in response to the Chinese boycott of Japanese goods, the military aim of transforming China into a population outlet during the 1930s was at odds with the Japanese business community, which only looked for political stability and business opportunities.

products, which remained almost stagnant in per capita terms for 60 years. From the end of the nineteenth century, textiles and other manufactures were the leading commodities exported.37 This process accelerated in the 1930s, with an outstanding expansion of manufacturing exports in the international context. This expansion of exports consolidated industrial modernization and the historical change of comparative advantage away from primary commodities (Howe, 1999; Sugiyama,2013).

Figure 4.1: Japanese Exports (1934-36 $) and GDP per Capita (1913 $) and Japanese and World Manufacturing Export Performance (1953=100)



Source: *Constant exports come from Ohkawa et al. (1967-1989) Long Term Economic Statistics of Japan (LTES) and GDP per Capita in 1990 Int. dollars from Bolt, J. and van Zanden, J. L. (2014). Export shares come from Annual Returns of the Foreign Trade of the Empire of Japan and Japan and World comparative manufacture exports in volume (1953=100) from UN Historical Trade Statistics.*

Increases in productivity during Japanese industrialization lagged behind the observed rise in manufacturing exports. As mentioned in the previous section; however, during the interwar years, Japan expanded imperial networks with its colonies to develop a market for domestic industrial exports. In that sense, we will offer some preliminary

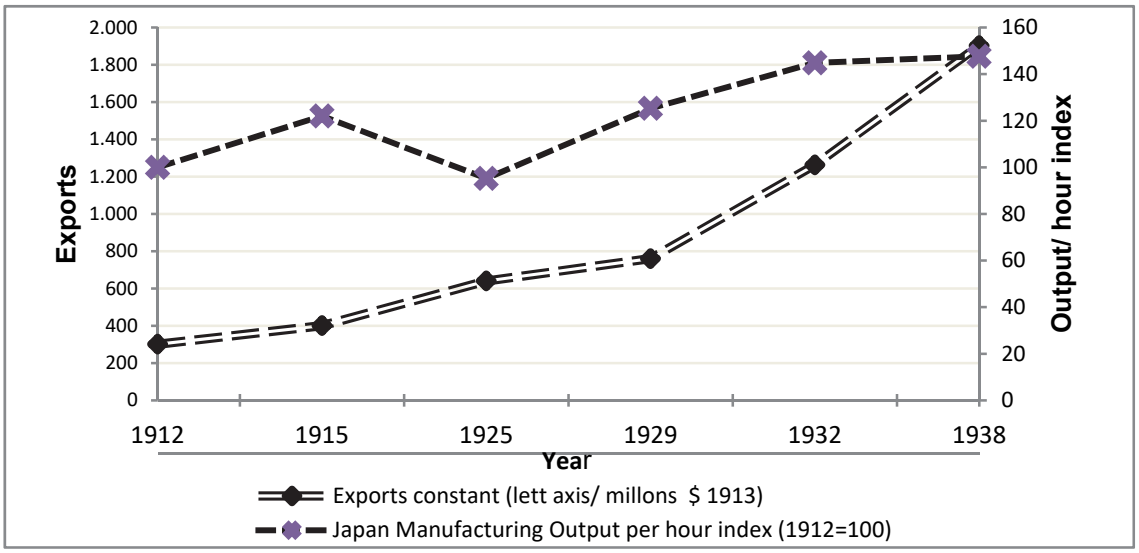
[37] Taking into account that raw silk is sold in bulk, whereas silk manufactures are sold individually, and that most transformations needed to produce raw silk are hand-made, we include raw silk as a primary product in Figure 4.1, following (Sugiyama, 2013; Francks, 2015; Smitka, 1998; Federico &Wolf, 2013; Souza, 2004).

evidence to clarify whether increases in productivity or imperial mechanisms exerted a stronger influence on the expansion of manufacturing exports.

4.3.1. Productivity or Empire, Which was More Relevant?

The first thing to be highlighted is that overall Japanese productivity increased importantly after WWI, and, as expected, accompanied by constant exports. But manufacturing output per hour hare the increase with constant exports only until 1932, later the first stagnant and the second experienced their greatest boom.

Figure 4.2: Japanese Productivity and Exports (1912-1938)



Note: *Constant Exports (base 1913$). Manufacturing output in 1929$ is divided by hours worked in the manufacturing sector.*

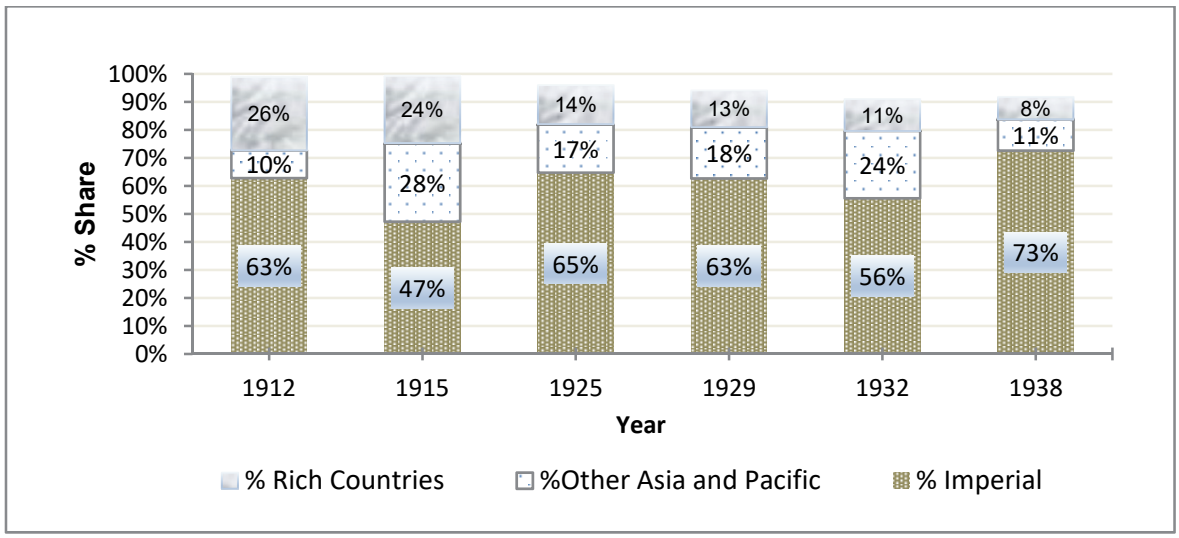
Source: *Exports and Manufacturing output per hour come from data set, see Section 4.*

The 1930s stagnation of manufacturing productivity in comparative terms also is highlighted by Broadberry et al., 'Japan catch-up', who showed a process of Japan's catching up with the UK in terms of manufacturing productivity between the 1890s and 1920s and that this process relented during the 1930s and 1940s**.** This means that although productivity might affect exports, they are also explained by other factors which will be explored throughout the rest of the paper.[38]

[38] There is a remote possibility that past increases in productivity are related with future increments of exports. Nevertheless, our regressions deny this possibility by including a lag of productivity as a likely determinant of current exports, and past increases in productivity were not significant in any specification.

On the other hand, Figure 4.3 shows that during the period of the faster growth of Japanese manufacturing exports, the main destinations of these exports were within the Japanese sphere of influence. More than 50% of exports after WWI went to territories within this sphere where we include both colonies receiving the majority of manufacturing exports and regions in Southeast Asia occupied during WWII. Further, these territories' share of Japanese exports rose faster than for destinations outside of Japan's sphere of influence during the 1930s, reaching 73% of the total in 1938.

Figure 4.3: Japanese Manufacturing Exports by Region (1912-1938) (%)



Note: *The remaining share of 100% corresponds to poor countries outside Asia.*

Source: *Annual Return of Trade for the Empire of Japan (various years).*

Indeed, the international context in the interwar years had changed drastically, especially after the Great Depression, and international markets increase manufacturing trade barriers and conditioned the creation of new regional trade blocs. What happened in the Indian market, where Japan had increased its share of textile exports in competition with Britain, is a clear example of the trade diversion forced by these policies. Japan was forced to retreat from those territories after the Commonwealth's Trade Bloc policy, adopted after the 1932 Ottawa conference, raised tariffs (for an extended discussion of this point, see Appendix B).

Japan's remarkable success in manufacturing exports during 1932-38 is not comparable to any other country's experience during the period (see Figure 4.1). Evidence of improvements in productivity does not explain such success. We think this success is principally determined by the reinforced bias of manufactures towards countries under

Japanese imperial influence. This evidence may indicate that the effect of colonial mechanisms and other regional commercial forces with the future occupied territories, previously mentioned, were more relevant than productivity increases — the next section analyses how those mechanisms worked and what kind of exports they facilitated.

4.3.2. Did Empire Facilitate New Exports or Reinforce Pre-Existing Comparative Advantage?

The first thing we must disentangle is the pattern of Japanese comparative advantage. For that purpose, Table 4.1 shows that among industrial products, Japanese exporters enjoyed a definite comparative advantage in textiles and clothing, which were low-skill in nature.

Table 4.1: Revealed Comparative Advantage by Country in Three Main Commodities.

TEXTILES/CLOTHING	1899	1913	1929	1937
BRITAIN	1.27	1.42	1.48	1.56
U.S.A	0.21	0.23	0.27	0.21
FRANCE	1.05	1.25	1.38	1.14
GERMANY	0.74	0.55	0.58	0.49
JAPAN	1.67	1.79	2.45	2.7
MACHINERY/ELECTRICAL EQUIPMENT				
BRITAIN	1.19	0.93	0.8	0.93
U.S.A	2.32	1.85	1.72	1.65
FRANCE	0.39	0.34	0.46	0.43
GERMANY	0.86	1.28	1.31	1.29
JAPAN	0	0.04	0.15	0.34
MACHINERY/TRANSPORT EQUIPMENT				
BRITAIN	1.68	1.19	0.92	0.96
U.S.A	1.17	1.37	2.07	2.2
FRANCE	0.47	1.25	0.68	0.72
GERMANY	0.49	0.7	0.4	0.75
JAPAN	0	0.13	0.13	0.39

***Note**: Revealed comparative advantage is defined as a country's share in world exports of a particular manufactured commodity, divided by its share in the respective world manufacturing exports.*

***Source**: Howe (1999).*

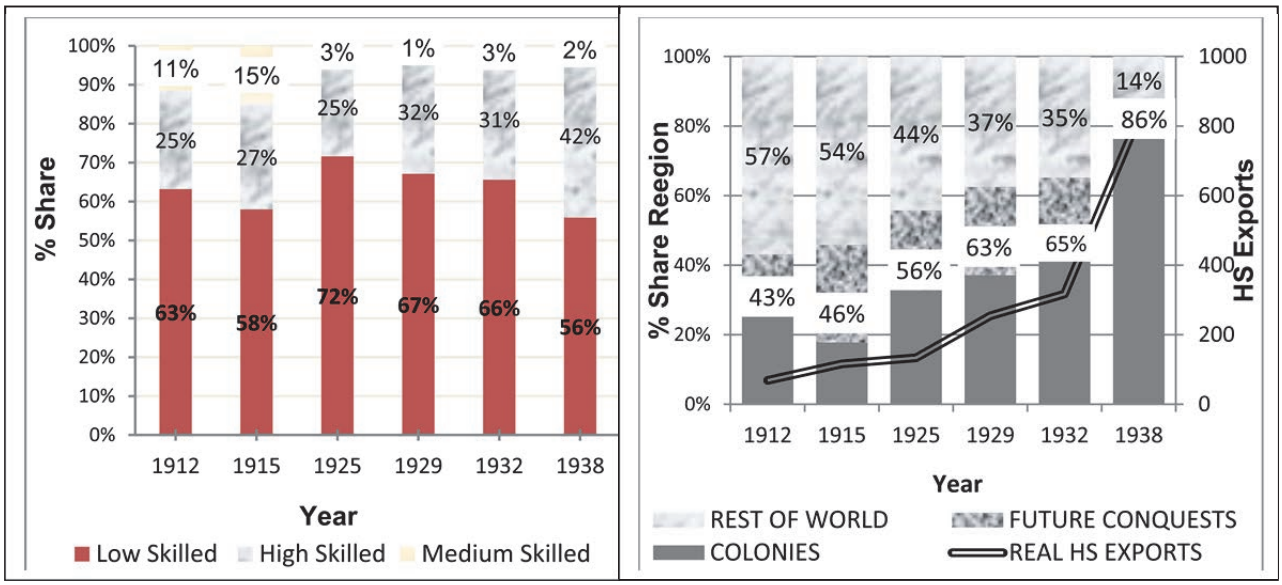
Japan's comparative advantage in textiles was a relevant part of the Japanese drive to increase manufacturing exports before the Second World War. Textiles are included in

our low-skill sector (which we divide between high-end and low-end, see Appendix B). Most of the textiles exported were low-end, representing a stable share of around 70% throughout the interwar years. Before the First World War, textiles were mainly exported to formal and informal Japanese regions of influence—mostly from Hong Kong, China, and Korea (Meissner and Tang, 2018). But they spread to other destinations outside the Japanese sphere of influence during the 1920s, such as India. After the Ottawa agreement (1932), the destination of Japanese exports changed from India to Japanese colonies (more evidence on this point in Appendix B).[39]

This pattern reflects the composition of Japanese exports during the interwar years, which was mainly focused on low-skill manufactures, as shown in Figure 4.4. The figure also highlights that high-skill exports, which did not enjoy a comparative advantage, led to export expansion during the period 1932-38. This fact suggests that such an increase was possible mainly because these goods were directed to countries inside the Japanese sphere of influence.

Figure 4.4: Japanese total manufacturing exports by skills and region.

a) Manufacturing exports by skills **b) Real high-skill exports by region**

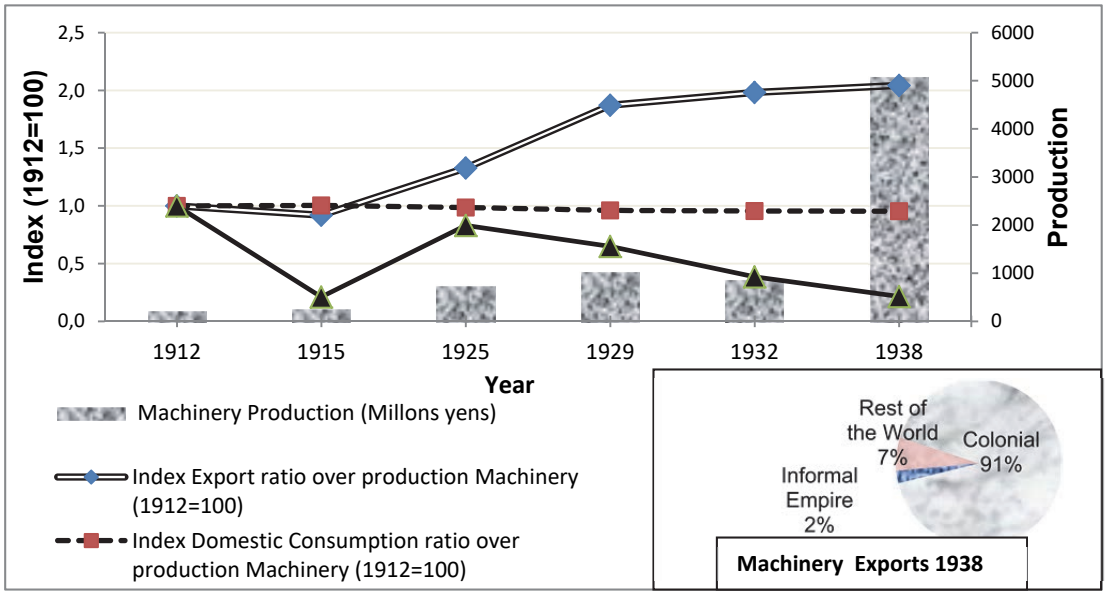


Source: *See data set, Section 4, and Annual Returns of the Foreign Trade of the Empire of Japan.*

[39] Appendix B shows that although Ottawa reinforced Japanese colonial bias, colonial trade was strong enough in every period so it wasn't just a market of last resort.

Next, it is pertinent to provide specific examples of how imperial mechanisms fostered Japanese high-skill exports within East and Southeast Asia.[40]As said before, in the 1930s, Japan implemented a plan for rapid industrialization of Korea and Manchuria, which facilitated its exports of high-skill manufactures. It can be appreciated in Figure 4.5, which shows that after 1925, Japan reduced its machinery imports and began a massive increase of local machinery production, which was completed by 1938. At the same time, the percentage of exported machines over total production exploded after 1925, suggesting that this import substitution strategy was complemented by the necessary extension of exportation of machinery to other territories to consolidate the Japanese industrialization process. In that sense, the right-hand portion of Figure 4.5 shows that those new markets located in Japanese colonies received 80% of total machinery exports in 1938. So, the industrialization of the colonies was based in Japanese machinery exports, opening new markets for Japanese producers.

Figure 4.5: Index of Machinery Exports, Imports, and Domestic Production (1912=100).



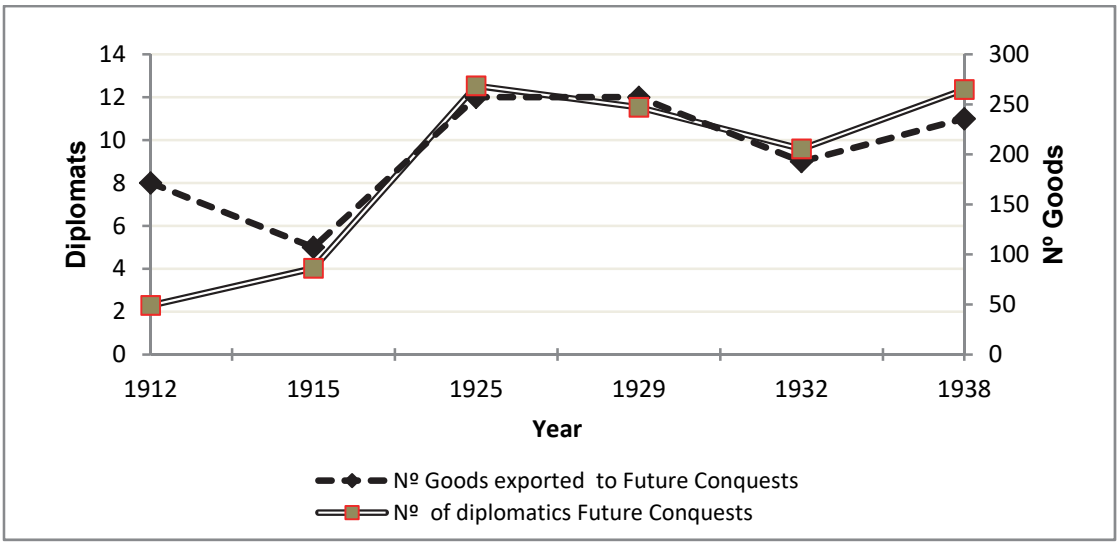
Note: *Indexes measure the evolution of the shares of exported, imported, and consumed machinery over total Japanese production (1912=1).*

Source: *Ohkawa et al. (1967-1989) and Annual Returns of the Foreign Trade of the Empire of Japan.*

[40]Our data shows that Japanese colonies received a remarkable proportion of infrastructure and military related high-skill exports (iron and steel for railways, cement for railroads, weapons and munitions). Those goods were mainly demanded by Japanese military colonisers. We also see, however, the rising relevance of machinery and other industrial exports devoted to the economic development of the colonies, which was demanded by Japanese businessmen established there. Some authors like (Kohli, 1994) relate those exports to Korean future development.

Furthermore, it is also crucial to understand how economic connections with informal empire could facilitate Japanese exports. It is believed that that new goods are more vulnerable to information-related impediments (Martinicus et al., 2010). So, those mechanisms explained in Section 2 helped to reduce information costs and uncertainty in a more significant proportion in high-skill new goods manufacture exports than in the rest. In that sense, the number of Japanese diplomats operating abroad is a suitable proxy for measuring those connections. Figure 4.6 shows that after WWI the number of diplomats abroad and the number of new products exported by Japan to countries within the future conquests followed the same tendency. This fact suggests that Japanese interests in Southeast Asia worked mainly to facilitate the introduction of newly developed Japanese products in those countries.[41]

Figure 4.6: Number of Japanese diplomats and products exported towards Japanese "Future Conquests" (1912-1938).



Source: *The number of Japan's Diplomats abroad comes from Almanac de Gotha (various years, see Section 4.2, Appendix B) and the number of goods exported from Annual Returns of Trade of the Empire of Japan (feature years).*

In short, we hypothesize that Japanese exports increase in the 1930s was allowed by imperial connections that fostered non-comparative advantage high-skill manufactures and new products. After presenting our marginal gravitational model and original data set in the next sections, we will provide empirical confirmation of the imperial power hypothesis.

[41] Either the number of Japan's diplomats abroad or the foreign diplomats in Japan is offered in Table B.3 and Table B.4 in Appendix B.

4.4. Margins of Trade Model.

The traditional Gravity Model assumes that trade flows travel between two countries attracted by two main forces. Countries' economical size attracts trade flows, whereas the distance between countries discourages flows. Providing that our dataset is a panel with information for many countries across six different periods and that trade flows are sometimes equal to zero, we have decided to estimate the model following the standard PPML procedure (Santos Silva and Tenreyro, 2006). The independent variables (with the exceptions of dummies) are nevertheless logged for the sake of simplicity in their coefficients' interpretations because this practice would permit us to interpret them as slopes.

This model, of course, can be augmented by controlling for more variables, which is a common practice in the literature. Two groups of variables are included, first, those variables associated with comparative advantage, CA_{it} (related either with productivity, relative wages, factor endowments, or similar demand structure), and second, those variables associated with trade or transaction costs (transport cost, tariffs, exchange rates, and empire connections).

In the comparative advantage group, first, we used relative productivity measures, such as the Japanese GDP per hour worked relative to partner countries.[42] Second, we used a variable measuring relative real wage trends as a ratio, so that a rise of the variable reflects increases in Japanese wages relative to a trading partner. Next, the third type of variable refers to differences in demand structure (proxied by GDP per capita differentials).[43]It captures whether Japanese exports were more intensive towards countries presenting similar demand structures (Linder, 1961). This hypothesis has been successfully tested for Latin America and for Japan (Restrepo and Tena-Junguito, 2016; Meissner and Tang, 2018). Finally, we checked whether Japanese trade followed a Hecksher-Ohlin pattern in

[42] The variable refers to GDP per hour worked excluding agriculture productivity. Additionally, for sector-level analysis, we include Japanese product per hour on high- and low-skill manufactures found in LTES. Then it is compared with the partner's overall productivity following the same methodology as for real wages. For further discussion regarding this variable, see appendix B.

[43] The log of the absolute differences in GDP per capita between Japan and the corresponding partner proxies for differences in demand structure. We have also tried to measure differential in demand structure as the product of the bilateral income share (Yi)/(Yi+Yj)* (Yj)/(Yi+Yj), obtaining similar results because taking logs reduces the differences between relative and absolute figures. Finally, several authors suggest the use of differences in the degree of urbanisation or industrialization as a proxy, these measures are very controversial as representative of differential in demand structure, however, and in our case, it is very difficult to collect representative data.

which exports revealed comparative advantage is founded or not in differences in relative factor endowments (population density in this case).

On the trade cost group, we include a variable called TC_{it} That is intended to capture the effects of trade costs like average freight factors, average levels of protection in partner countries, exchange rates index with the Japanese Yen, the imposition of exchange controls, or the number of Japanese diplomats abroad. Following our previous discussion on the relevance of empire, we add other transaction cost variables, which are the most relevant ones in our analysis, including: $COLONY_{it}$ (a dummy taking the value 1 if a country is a Japanese colony 0 if not and that is dynamic as it changes whenever a territory is conquered) that captures all those mechanisms by which Japanese imperial aims fostered exports, and $FUTURE\ CONQUESTS_{it}$, a static dummy that determines whether Japanese exports were already biased towards countries occupied during WWII.

Finally, two additional variables are intended to capture the difference between international and domestic demand occasioned by trade distortions and other path dependence fundamentals. The first variable controls for Japanese partners' imports and is primarily devoted to capturing the trade blocs and other trade diversion protectionist measures that affected bilateral international demand above domestic GDP variations. This variable would be specially relevant during the 1930s. The second one β_t represents time dummies that permit us to control changes related to the passage of time (like inflation or the First World War international disintegration) and ε_{it} , that are standard errors clustered by the country partner, as show equation 4.1.

$$Exp_{it} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 CA_{it} + \beta_3 TC_{it} + \beta_4 COLONY_{it} + \beta_5 FUTURE\ CONQUESTS_{it} + \beta_6 IMPORTS_{it} + \beta_t + \varepsilon_{it} \quad \text{(EQ 4.1)}$$

Another novelty of this article lies in the employment of margins of trade framework that allows us to determine by which channels the different independent variables affected Japanese exports. In that sense, the extensive margin represents the number of active sectors exported by Japan to each country (*i*) and during each period (*t*) (Meissner and Tang, 2018). This margin better explains the structural change. In our claim, sectors are defined according to the 3-digit level of the SITC Revision 2 description, in the sense that all products sharing the first three digits will be collected within the same sector, so we avoid accounting for different varieties of existing products as they were new goods

(for an extended discussion of this issue see Appendix B).[44] Using this methodology, we observe that Japan moved from exporting in 117 sectors to exporting in 164. The intensive margin, on the other hand, represents the average export value by sector to each country in every period.[45] In this sense, equation 4.2 displays the extensive margins by employing the number of active sectors exported as the dependent variable and equation 4.3 uses exports per sector to country *i* in period *t* for presenting intensive margins.

$$N^{o}SECTOR_{it} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 CA_{it} + \beta_3 TC_{it} + \beta_4 COLONY_{it} + \beta_5 FUTURE\ CONQUESTS_{it} + \beta_6 IMPORTS_{it} + \beta_t + \varepsilon_{it} \quad \text{(EQ 4.2)}$$

$$ExpSECTOR_{it} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 CA_{it} + \beta_3 TC_{it} + \beta_4 COLONY_{it} + \beta_5 FUTURE\ CONQUESTS_{it} + \beta_6 IMPORTS_{it} + \beta_t + \varepsilon_{it} \quad \text{(EQ 4.3)}$$

Finally, the model might experience some modifications because the dependent variable could be divided by different skills products (high- and low-skills manufactures and primary products) or what were the main determinants of exports to a specific region.

4.5. The New Data Set

4.5.1 Trade Data.

As mentioned in the introduction, one of the principal contributions of this paper is the construction of a granular data-set that provides a high-resolution image of the value of Japanese exports by product, year and the geographical destination following the same level of disaggregation as official Japanese trade records. We digitized information found in different volumes (1912, 1915, 1925, 1929, 1932, and 1938) of the *Annual Return of the Foreign Trade of the Empire of Japan.* Official statistics collected and published annually by the Japanese Bureau of Customs appear disaggregated at the product level and show quantities and values exported from Japan by destination.[46] According to our data set,

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[44] We also employed a method similar to (Huberman and Meissner, 2007) in which the extensive margin represents each single good exported by Japan. Results hold very similar. This method has been disregarded, however, because it might bias our results as this method might show different varieties of existing products as new products. See Appendix B.

[45] IM= $\frac{Nominal\ exports_{it}}{Number\ of\ Sectors_{it}}$

[46] We discuss the accuracy of the Japan trade statistics in Appendix B.1. Although, we assume Japan used quite accurate declared values for exports, but some inaccuracy on country real destination records for goods moving through Hong Kong and Singapore. We have evidence that the Hong Kong share of total China

Japan moved from exporting 512 different products to 37 different countries in 1912, to exporting 1135 goods to 117 countries in 1938, although this evolution might be subject to specific statistical concerns (See Appendix B).

The main drawback of the *Annual Return* as a source is that it does not include data in Japanese exports towards its main colonies, Korea and Taiwan. (Although, thankfully, they account for exports towards the Kwantung Leased Territory and Manchuria, both before and after being occupied by Japan). On the one hand, it is a fundamental inaccuracy in the statistical records; on the other hand, Japanese export patterns towards its colonies is vital for our research interests. We resolve this contradiction using a second-best option with more aggregate information in Japanese exports to Taiwan.[47]

The level of disaggregation included in this data set is lower than that of the main statistics after 1915, so it would underestimate Taiwan's extensive margins of trade. We have assumed that the number of products exported to Taiwan after 1915 follows the same rate of increase as that of the Kwangtung Leased Territory—the only Japanese colony for which there is full information throughout the period. For the case of Korea, the *Annual Returns of the Foreign Trade of the Empire of Japan* in their volumes from 1914-1920 include an appendix with data in Japanese exports to Korea at the product level.[48]

The data set that we constructed provides for the value of Japanese exports (in current *Yen*) of each product exported to every country. Each different product exported has been categorized using the Standard International Trade Classification (SITC) Revision 2 to a 5 digit-level disaggregation to achieve a proper and precise product classification. The

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imports declined from around 40% at the turn of the Century to less than 20% in the 1920s, and less than 5% in the 1930s. This implies that inaccuracy of Japan's direction of trade records due to transit is more limited for the interwar years than for previous periods (see Figure 5 in Keller et al, 2011).

[47] For 1912 and 1915, there is full disaggregation of exports at the product level. For the period 1925-1938, LTES includes data on Japanese exports to Korea in five different sectors that match our skill distribution. Thus, the number of goods at every skill level exported by Japan will be equal to the corresponding 1915 figure assumed to evolve along the same path as that of Kwantung, which shared a similar economic structure to Korea. See discussion in Appendix B.

[48] The data came from the Returns of the Trade of Taiwan for Forty Years (1896-1935) and the annual Return of Trade of Taiwan (Formosa) (1936-1942), both published by the Department of Finance of the Government of Taiwan. These returns include Taiwanese imports from Japan (or, equivalently, Japanese exports to Taiwan) at product level. For the rest of the period, Japanese exports to Korea have been estimated by the Japanese Long Term Economic Statistics (LTES) database. The Kwangtung Leased Territory was the colony that received the greatest number of Japanese goods that is why it could be considered an upper-bound for calculating the evolution of the extensive margin to Taiwan. See an extended discussion in Section Appendix B.

different goods have also been divided according to skill intensity (Tena-Junguito, 2010). Skill intensity is constructed based on wages earned by workers in each sector and permits us to differentiate between high-skill (Skill intensity higher than 10), medium-skill (between 9 and 10), low-skill manufactures (between 5 and 9), and primary products (less than 5 skill intensity).[49]

4.5.2. GDP and Productivity

Information on GDP and GDP per capita is taken from the latest version of the Maddison Project and refers to GDP in 1990 GK dollars or real GDP (Bolt and van Zanden, 2014). For missing countries, we took data on real GDP for 1950 and translated it to the interwar years by assuming the same evolution as constant exports (Federico and Tena-Junguito, 2019).

Besides, we estimated GDP levels and other statistics for Japanese colonies of Kwantung Leased Territory and Manchukuo (Manchuria). First, we obtained population data (Kang, 1981). Then, the corresponding GDP is calculated as the proportion of Japanese GDP equal to the percentage each population represents over the Japanese total (the exercise for Manchuria is the same except China is used as the reference because it was part of China until 1932). We considered Kwantung's GDP to follow the same rate of growth as Japan's (because it was a Japanese colony), whereas we found Manchuria's GDP to follow the same tendency as China's until 1932. Afterwards, we assumed Manchuria's GDP to grow at the same rate as Manchurian exports (Federico & Tena-Junguito, 2019).

We use GDP information, complemented by data on total hours worked.[50] Then, we construct non-agrarian GDP per hour worked as a measure of productivity for 27 partner countries, which represent 92% of Japanese exports. The real wages index for capturing productivity evolution for 30 partner countries comes from Williamson article and population density from the League of Nations (Huberman and Mins, 2007; Maddison, 1995). Finally, we construct price indexes for deflating GDP measures (Mitchell, 2003).

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[49] We recognize that, on one hand, this division represents a very rudimentary way of capturing skill improvements inside sectors, especially productivity increases in Japanese textile industries in the 1920s and 1930s (Wolcott, 1994), but on the other hand, this strategy captures better Japan's manufacturing dual aggregate sectoral advance in the second industrial revolution technologies as an indicator of industrial modernization in the inter-war years, which is the main objective of the paper. In Appendix B, we offer an extended discussion of the general division of total exports by skill intensity in conjunction with a complementary analysis of the geography and main drivers that explain the Japanese textile exports increase in the interwar period.

Finally, one essential part of this analysis is the study of Japanese productivity and the study's determination of exports by skill level. To disentangle this relationship, we employed data in Japanese manufacturing output and employment by sectors. To approximate hours worked at every sector, we use data derived from total hours according to the Long Term Economic Statistics of Japan (LTES) database from Hitotsubashi University.

4.5.3. Trade Costs

Distance between countries is the most common variable to measure transport costs in the literature on gravity, but this variable is time and product invariant. This paper makes an effort to overcome the implications of this limited assumption on the measure of transport cost. So we use a data set of estimated freight factors (cost of transport per ton/product price per ton) between Japan and each partner country, for every single product exported by Japan for each of our corresponding benchmark years. In our strategy, the geographical distance between Japanese partners is combined with different freight rates, routes, and differences in freight factors by the composition of products.[51]

The information on the number of Japanese diplomats operating in each different country has been obtained from the *Almanac de Gotha* (various years), which includes a section with the names and country of origin of every diplomat operating in every country, so we have counted the Japanese ones. Additional variables representing trade costs are average levels of tariff protection and exchange rate control (Blattman, 2003; Bethell, 1994; Eichengreen, 1996; Meisel, 1990; Reinhart and Rogoff, 2004).[52] Finally, bilateral nominal exchange rates with the Japanese Yen, determined as being the quantity of foreign currency per one Yen. Then we construct an index (1912=1) to measure the evolution of different exchange rates from a joint base. Besides, we have used data about nominal imports to capture the differences introduced by the protectionist backlash between domestic and international demand, especially in the 1930s (Federico and Tena-Junguito, 2019).

[51] The alternative use of the conventional great-circle distance in our equations offers weak results similar to the use of freight cost by products and regions. Apparently, this happens because freight factors of manufactures are low. Additionally, international freight rates during the interwar years were not volatile but stagnant. See an extended discussion in Appendix B.

[52] Tariffs between Japan and its colonies are assumed to be zero.

4.6. Results

4.6.1. Presentation of Results

The descriptive statistics presented in Section 3 showed that Japanese exports increased significantly between 1912 and 1938, specially during the 1930s. These data also suggested that, although Japanese improvements in productivity contributed to the expansion of exports (either by different product varieties or more diverse destinations), specially before 1929, they were not the primary determinant of the structural change in Japanese industrial exports. Evidence presented in previous sections also suggested that among industrial exporters, Japan persisted with a comparative advantage in low-skill manufactures, such as textiles, although high-skill exports increased substantially during the 1930s. That evidence leads to our central hypothesis, developed in Section 3, that imperial mechanisms, not productivity, were the main drivers that facilitated high-skill manufacturing exports, and links with future conquests fostered the introduction of new Japanese products in the region.

This section will test the resilience of that hypothesis using the previously mentioned models. First of all, we examine which factors determined Japan's total exports during the whole period. Table 4.2 shows how one of the measures employed for approximating Japanese relative productivity is significant when we do not control for Japanese colonies. However, upon the inclusion of the colony dummy and other potential links with future conquests in Southeast Asia, productivity measures cease to be significant. Of which, we deduce that this evidence reinforces the *trade in the shadow of power* hypothesis. That´s we assume that Japanese imperial connections are compensating the existence of low productivity to facilitate overall exports. In that sense, the bias of Japanese exports towards its colonies has the expected reaction. Furthermore, it is also evident that Japan already had established certain economic relations that facilitated exports towards those territories, which Japan subsequently occupied during WWII.

The trade generation capacity of the Japanese Empire during the interwar years was much higher than the ones shown by the literature for the preceding period (1870-1913) (Mitchener & Weidenmier, 2008). We should be careful with those results because they might be subject to particular statistical concerns, but they are in line with related works studying intra-bloc trade bias in the Japanese Empire during the same period (Okubo, 2007). Specifically, we've found that Japanese Empire membership increases in trade by more than ten times than those associated by the British, German and French Empires, and

more than two times more significant than those of the US and Spanish Empires. It could be the case that our coefficients are more prominent because they are capturing the strong intra-bloc bias that emerged after the Great Depression. However, the Japanese Empire trade generating effect is also around ten times bigger than the ones found on the Sterling and Reichsmark blocs in the 1930s (Ritschl and Wolf, 2003). Furthermore, the trade bias experienced between Japan and its informal empire was comparable to the ones of those currency areas.[53]

According to the literature, another variable that may capture Japanese economic interests in a territory before annexation is the number of diplomats in that territory, which in this case is positive and significant, although its influence in Japanese exports vanishes when we account for informal imperial links. The positive correlation between the number of diplomats abroad and the Japanese informal empire dummy variables would suggest, as mentioned in Section 2, that both worked through similar mechanisms.

Regarding the Japanese specialization pattern, we can appreciate how Japan tended to export more towards countries presenting more significant differences in demand structure (GDP per capita) and population density (factor endowments). This fact contradicts the Linder hypothesis for interwar Japan and places its exports pattern closer to a Hecksher-Ohlin model. Japan's GDP per capita was converging with rich countries and diverging with poor ones in contradiction with demand convergence Lindert hypothesis. Furthermore, it suggests that Japanese industrial exports pattern contributed to the demand complementarities found on chapter 2. Finally, it is also remarkable how among all the possible trade costs undermining Japanese exports, the only significant one is the relative appreciation of the Yen (the significant negative effect of tariffs vanishes when we account for the colonial framework).

[53] (Larch et al., 2017) shows that the interpretation of dummy coefficients like Colony or Informal Empire is the following: $e^{3.166} - 1 = 2271\%$ higher exports for colonies in comparison with non-colonial territories and $e^{0.983} - 1 = 167\%$ for future occupied territories.

Table 4.2: Japanese Total Export Determinants.

	VARIABLES	No Empire	Empire	EXPECTED SIGN
Gravity →	GDP	1.320***	1.156**	+
		(0.403)	(0.458)	
Comp. Advantage	RELPRODUCTIVITY	0.198	0.198	+
		(0.301)	(0.347)	
	RELWAGES	1.166***	0.461	+
		(0.345)	(0.354)	
	POPDENSITYDIFF	0.461*	0.406**	+
		(0.257)	(0.196)	
	GDPCAPABSDIFF	1.417***	1.644***	+
		(0.498)	(0.455)	
Trade Costs	FREIGHTS	-0.273	-0.0745	-
		(0.229)	(0.224)	
	EXCHCONTROL	0.0255	-1.352*	-
		(0.971)	(0.766)	
	EXCHRATE	-0.674**	-0.810***	-
		(0.290)	(0.190)	
Trade diversion	TARIFF	-0.930***	-0.134	-
		(0.118)	(0.182)	
	IMPORTS	0.0935**	0.216	+
		(0.0471)	(0.217)	
Empire	COLONY		3.166***	+
			(0.812)	
	FUTURE CONQUESTS		0.983***	+
			(0.336)	
	DIPLOMATS	0.283***	0.176	+
		(0.0849)	(0.114)	
	Constant	-4.221	-7.277	
		(5.652)	(4.653)	
	Observations	674	674	
	R-squared	0.643	0.647	

Note: *Standard errors clustered by country. Time dummies included in the regression but excluded from results display.* *** *p<0.01, ** p<0.05, *p<0.1*

Once it becomes clear that imperial connections were more relevant than productivity improvements on the determination of the direction of Japanese exports, it is crucial to see which kinds of exports were affected by those mechanisms. Table 4.3 confirms our previous insights that Japanese comparative advantage determinants specially affected low-skill exports because relative productivity and real wage increase had a more significant effect on these kinds of goods, suggesting that, according to factor endowments and market forces, Japan was competitive producing low-skill manufactures.

On the other hand, colonial and other political mechanisms played a significant, decisive role in every export category. In addition, the results in Table 4.3 show that being a Japanese colony was by far the leading factor attracting high-skill exports (its effect is much higher than that of productivity), suggesting that colonies became new markets for those Second Industrial Revolution goods in which Japan did not possess a comparative advantage. This market for high-skill products was possible due to the mechanisms previously explained. Contrary to total exports, the 'future conquest' regions are more relevant to explain export growth on low-skill intensity exports, which would mean that informal power mechanisms established in Southeast Asia before the Second World War reinforced Japanese comparative advantage within the region. [54]

[54] Appendix B shows a disaggregated regression for high- and low-end textiles. Both display similar behavior and present little difference with the overall determinants of low-skill exports.

Table 4.3: Japanese Export Determinants by Skill Level

VARIABLES	(1) High Skills	(2) Low Skills
GDP	0.320	0.680***
	(0.327)	(0.220)
REL PRODUCTIVITY HS	0.738**	
	(0.313)	
REL PRODUCTIVITY LS		0.887***
		(0.177)
RELWAGES HS	0.0394	
	(0.354)	
RELWAGES LS		0.628**
		(0.302)
POPDENSITYDIFF	0.321	0.467***
	(0.253)	(0.137)
GDPCAPABSDIFF	1.907***	0.557
	(0.527)	(0.431)
FFHIGHSKILL	-0.229	
	(0.221)	
FFLOWSKILL		-0.301*
		(0.169)
EXCHCONTROL	-1.083	-0.750
	(0.692)	(0.467)
EXCHRATE	-0.469***	-0.608***
	(0.162)	(0.198)
TARIFF HS	0.0875	
	(0.0945)	
TARIFF LS		-0.259***
		(0.0938)
IMPORTS	0.402**	0.163***
	(0.181)	(0.0409)
COLONY	3.922***	2.968***
	(0.556)	(0.374)
FUTURE CONQUESTS	1.089***	2.347***
	(0.397)	(0.470)
DIPLOMATS	0.0895	0.289**
	(0.136)	(0.129)
Constant	-4.962	-0.927
	(3.438)	(2.781)
Observations	676	676
R-squared	0.545	0.763

Note: *Standard errors are clustered by country. Time dummies are included in the regression but are excluded from the results display. *** p<0.01, ** p<0.05, *p<0.1*

Finally, Table 4.4 distinguishes export determinants according to their effects on either the number of different sectors in which Japan exported (extensive margin) or the value exported per industry (intensive margin) and according to also skill level. The results show that relative productivity did not affect any margin and that the Japanese Empire specially favored exports in new sectors, confirming the connection with industrial development and innovation.

Table 4.4: Japanese Export Determinants According to Extensive and Intensive Margins

VARIABLES	(1) Extensive Total	(2) Intensive Total	(3) Extensive HS	(4) Extensive LS	(5) Intensive HS	(6) Intensive LS
GDP	0.353***	0.264***	0.286***	0.189*	0.277***	0.676***
	(0.112)	(0.0928)	(0.104)	(0.110)	(0.102)	(0.235)
REL PRODUCTIVITY	-0.243	-0.238				
	(0.242)	(0.218)				
REL PRODUCTIVITY HS			0.0842		0.0539	
			(0.115)		(0.111)	
REL PRODUCTIVITY LS				-0.489**		0.847***
				(0.241)		(0.166)
RELWAGES	0.234	0.226				
	(0.195)	(0.186)				
RELWAGES HS			-0.166		-0.364**	
			(0.162)		(0.174)	
RELWAGES LS				0.680***		0.569*
				(0.177)		(0.319)
POPDENSITYDIFF	-0.00898	-0.0208	-0.0433	-0.0210	-0.0450	0.389***
	(0.0625)	(0.0521)	(0.0731)	(0.0656)	(0.0618)	(0.127)
GDPCAPABSDIFF	0.0109	0.0176	0.172	0.0198	0.0920	0.414
	(0.218)	(0.181)	(0.236)	(0.212)	(0.204)	(0.383)
FREIGHTS	-0.294**	-0.190				
	(0.140)	(0.126)				
FFHIGHSKILL			-0.429***		-0.317***	
			(0.122)		(0.123)	
FFLOW SKILL				-0.287*		-0.322*
				(0.152)		(0.179)
EXCHCONTROL	-0.427**	-0.562***	-0.741***	-0.506**	-0.669***	-0.715
	(0.211)	(0.208)	(0.287)	(0.233)	(0.215)	(0.486)
EXCHRATE	-0.0834	0.0334	-0.120**	-0.0396	-0.00434	-0.502**
	(0.0591)	(0.0598)	(0.0546)	(0.0693)	(0.0559)	(0.202)
TARIFF	-0.145	-0.148**				
	(0.0944)	(0.0737)				
TARIFF HS			0.0172		-0.0132	
			(0.0707)		(0.0628)	
TARIFF LS				-0.00191		-0.290***
				(0.0877)		(0.0954)
IMPORTS	0.0363	0.0227	0.0252	0.0271	0.0187	0.146***
	(0.0457)	(0.0302)	(0.0407)	(0.0411)	(0.0350)	(0.0298)
COLONY	0.791**	0.409	0.771***	0.429	0.498*	2.850***
	(0.398)	(0.344)	(0.294)	(0.371)	(0.302)	(0.369)
FUTURE CONQUESTS	0.777***	0.508**	0.476	0.454	0.391	2.402***
	(0.229)	(0.199)	(0.381)	(0.428)	(0.350)	(0.495)
DIPLOMATS	0.105	0.130*	0.134*	0.124*	0.137*	0.246
	(0.0769)	(0.0671)	(0.0752)	(0.0722)	(0.0759)	(0.159)
	-0.455	-2.814**	-1.134	-1.124	-3.706***	-2.702
	(1.535)	(1.284)	(1.433)	(1.284)	(1.338)	(2.634)
Constant	-0.455	-2.814**	-1.134	-1.124	-3.706***	-2.702
	(1.535)	(1.284)	(1.433)	(1.284)	(1.338)	(2.634)
Observations	674	674	676	676	676	676
R-squared	0.486	0.504	0.505	0.411	0.471	0.744

Note: *Standard errors clustered by country. Time dummies included in the regression but excluded from the results display. *** p<0.01, ** p<0.05, *p<0.1*

The most important conclusion we reach disaggregating by skill level is that high-skill exports are more sensitive to the extensive margin than low-skill exports. The more significant connection between fixed costs and increases in new export products in the high-skill sector helps to understand that higher sensitivity. We can also appreciate how improvements in Japanese productivity mainly increased the intensive margin for low-skill products, that´s with the low technological and less innovative sectors. On the other hand, being colonized by Japan was the main driver of new extensive exports of high-skill manufactures, suggesting that those more modern and more sophisticated products were not internationally competitive and mainly traded in the colonies under the shadow of power coverage. This situation does not exclude the fact that both colonies and future conquests also facilitated low-skill exports at the intensive margin in a proper way.

This section confirms some of the hypotheses offered in the descriptive analysis: Imperial connections (both formal and informal) were more relevant than productivity in the determination of exports. In that sense, colonies became a new market for high-skill exports, while the informal empire reinforced comparative advantage in low-skill manufactures. Both also fostered exports from new sectors, confirming that Japanese industrialization was supported by conquest and suggesting that its imperial institutions influenced East and Southeast Asian regional specialization patterns.

4.6.2. Robustness Checks

To check whether our results are robust, we tested whether the previous conclusions still held when we employed different estimation methods and limited the potential endogeneity between the key variables. In that sense, Table 4.5 shows our main results estimated by a Tobit estimator, employing OLS, and a later panel estimation using Random Effects to finish with some checks on endogeneity.

Our results generally hold true to our hypothesis that Japanese relative productivity did not, in general, affect Japanese exports. First, being a Japanese colony was always the most crucial determinant of Japanese exports. Second, being part of Japan's future dominions was a significant additional attractor of Japanese exports in all estimation methods. Finally, trade costs and comparative advantage worked in the same direction as before.

We also checked the determinants of exports inside the formal and informal empire across benchmarks years to detect the different influences of change in imperial policy

throughout the period. Table 4.6 shows that Japanese productivity was significant only in 1932, but not in 1938, when regional exports reached a peak. On the other hand, being a colony strongly affected Japanese exports; the importance of this factor is much higher in 1938 than before because then Japanese trade policy towards its dominions was reinforced.

Table 4.5: Japanese Export Determinants Using Alternative Estimation Methods.

VARIABLES	(1) Tobit	(2) OLS	(3) Panel Random Effects	ExpectedSign
GDP	0.729***	0.729***	0.712***	+
	(0.164)	(0.261)	(0.205)	
REL PRODUCTIVITY	0.117	0.117	-0.0120	+
	(0.365)	(0.706)	(0.457)	
RELWAGES	0.830**	0.831	0.578	+
	(0.361)	(0.587)	(0.466)	
POPDENSITYDIFF	-0.232	-0.232	-0.139	+
	(0.150)	(0.229)	(0.163)	
GDPCAPABSDIFF	0.856***	0.854	0.920***	+
	(0.310)	(0.590)	(0.291)	
FREIGHTS	-0.647**	-0.649*	-1.081***	-
	(0.289)	(0.380)	(0.215)	
EXCHCONTROL	-0.250	-0.251	-0.284	-
	(0.922)	(0.579)	(0.614)	
EXCHANGERATE	-0.564***	-0.564**	-0.401**	-
	(0.188)	(0.234)	(0.184)	
TARIFF	-0.384**	-0.385	0.150	-
	(0.157)	(0.245)	(0.160)	
IMPORTS	-0.0265	-0.0266	0.0177	+
	(0.0353)	(0.0562)	(0.0491)	
COLONY	2.938***	2.932***	3.020***	+
	(0.656)	(0.947)	(0.808)	
FUTURE CONQUESTS	1.739***	1.736***	1.415**	+
	(0.360)	(0.604)	(0.617)	
DIPLOMATS	0.386***	0.386*	0.277*	+
	(0.145)	(0.223)	(0.155)	
Constant	6.886***	6.894*	5.471**	
	(2.031)	(3.816)	(2.158)	
Observations	314	314	314	
R-squared	0.1532	0.523	0.3607	

Note: *Standard errors clustered by country. Time dummies are included in the regression but excluded from the results display. *** p<0.01, ** p<0.05, *p<0.1*

Table 4.6: Japanese Export Determinants Towards Countries Inside Its Formal and Informal Empire.

VARIABLES	IMPERIAL EXPORTS	EXP SIGN
GDP	0.219	+
	(0.337)	
RELPRODUCTIVITY 1915	3.897*	+
	(2.101)	
RELPRODUCTIVITY 1925	2.315*	+
	(1.275)	
RELPRODUCTIVITY 1929	1.421	+
	(0.977)	
RELPRODUCTIVITY 1932	3.063**	+
	(1.494)	
RELPRODUCTIVITY 1938	2.174	+
	(1.416)	
RELWAGES	0.416	+
	(0.396)	
POPDENSITYDIFF	0.614*	+
	(0.353)	
GDPCAPABSDIFF	-0.309	+
	(0.497)	
FREIGHTS	-1.249**	-
	(0.575)	
EXCHCONTROL	0.692	-
	(0.803)	
EXCHRATE	-1.152***	-
	(0.350)	
TARIFF	-0.249	-
	(0.175)	
IMPORTS	0.154***	+
	(0.0487)	
COLONY 1915	-0.197	+
	(0.678)	
COLONY 1925	0.937*	+
	(0.566)	
COLONY 1929	0.522	+
	(0.506)	
COLONY 1932	1.115	+
	(0.718)	
COLONY 1938	2.745***	+
	(0.910)	
DIPLOMATS	0.260*	+
	(0.151)	
Constant	5.109	
	(4.737)	
Observations	96	
R-squared	0.771	

Note: *Standard errors clustered by country. Time dummies included in the regression, but excluded from the results display.*** *p<0.01, ** p<0.05, *p<0.1*

Finally, a critical drawback of our results could be the presence of endogeneity in different ways. It is a possibility that our results suffer from endogeneity. Previous economic and commercial links might motivate a military intervention and not in the other way around as we argue. This fact could explain why the impact of Japanese colonies on exports found in our results is so significant. Fortunately, the case of Manchuria, which for most of the period was not a Japanese colony, and occupied in 1931, might be useful for controlling for such endogeneity.

For that purpose, Japanese exports to Manchuria before and after military annexation are exploited to run a diff-in-diff estimation. In this case, Manchuria will be considered the treated group, as it was invaded by Japan in 1931. This event will be viewed as "the intervention". Thus, the periods before 1932 are defined as the pre-treatment period and that afterwards as the post-treatment period.[55] The control group will be all of those countries inside the region, whose performances as recipients of Japanese exports were similar to that of Manchuria before the intervention. Japanese intervention in Manchuria is considered as an exogenous event after we control for economic, diplomatic and transport costs, characteristics of every country inside Japan's sphere of influence.[56] We used the following diff-in-diff equation to estimate the effects of Japanese military intervention in Japanese exports towards Manchuria.

$$Exp_{it} = \beta_0 + \beta_1 Treated_{it} + \beta_2 Post1932_{it} + \beta_3 Treated * Post1932_{it} + \beta_4 X_{it} + \beta_t + \varepsilon_{it} \quad \text{(EQ 4.4)}$$

In this equation $Treated_{it}$ is a dummy variable that represents Manchuria, which is the only country in the sample that became a consolidated colony during the interwar years.[57] $Post1932_{it}$ is a dummy which equals 1 in 1938 (the post-intervention period). Finally, $Treated * Post1932_{it}$ is the diff-in-diff variable that represents the true effect of Japanese colonization on exports to Manchuria.[58] X_{it} describes the controls previously

[55] The military intervention took place in late-1931, but the colony was not established until early-1932. For that reason, it seems unlikely that the effects of colonization would be evident on 1932 exports. That is why 1938 is considered as the only post treatment period.

[56] In reality Japan was more likely to intervene in China or Manchuria for political and strategic reasons than in any of the other countries in the region, but theoretically the assumption is plausible.

[57] Part of China was also considered a Japanese colony by 1938, but it was not consolidated at all.

[58] Effect of intervention in the treated country=$(\beta_0 + \beta_1 + \beta_2 + \beta_3) - (\beta_0 + \beta_1) = \beta_2 + \beta_3$
Effect of (non)intervention in the control group= $(\beta_0 + \beta_2) - \beta_0 = \beta_2$
Total effect of military intervention= $(\beta_2 + \beta_3) - \beta_2 = \beta_3$

explained, including a restriction of countries that were part of Japanese dominions during WWII, whereas β_t are time-specific fixed effects. We used this equation to estimate the implications for countries inside the Japanese sphere of influence.

Table 4.7 offers the main results. First, we note that Japanese total and high-skill exports to Manchuria were lower than to the rest of the region for the whole period. Second, the results also show that both kinds of exports are higher after 1938 than before (although not significantly). Finally, and more importantly, the diff-in-diff variable is positive and significant, meaning that controlling for other variables, exports to Manchuria rose after occupation relative to the rest of the region, which suggests that after this effort to mitigate colonization endogeneity, the Japanese imperial export driver is robust as the explanation of export expansion. Furthermore, the effect of military occupation on high-skill exports is still very relevant and significant. This fact reinforces our premise that colonization was the main driver for the Japanese introduction of Second Industrial Revolution goods into East Asia.

Table 4.7: Diff-in-Diff Estimation for Japanese Exports Before and After Colonization.

	(1)	(2)
VARIABLES	Total Exports	High-skill
TREATMENT	-2.063***	-3.655***
	(0.352)	(0.357)
POST1932	0.686	0.323
	(0.472)	(0.565)
TREATMENTPOST1932	1.247***	3.640***
	(0.286)	(0.349)
Observations	96	96
R-squared	0.938	0.968

Note: *Standard errors are clustered by country. Time dummies and the rest of controls included on previous regressions are accounted in the calculations, but are excluded from the results display.*** p<0.01,** p<0.05, *p<0.1*

Another potential source of endogeneity comes from the impact that export growth may have had on productivity growth, transport cost, or commercial diplomacy. We offer some reverted explicative equations o the appendix (Table B.11) which show that exports did not affect Japanese productivity during the interwar years (or did so only in a weak way). There remains the possibility that trade costs and exports were bidirectional because

increasing exports might have further reduced trade costs between countries. Appendix B (table B.12) shows that this bidirectionality was real for Japanese exports and its diplomats abroad. To avoid the possibility that this phenomenon might spoil the effect of trade determinants, we lagged the independent variables. The results in Table 4.8 show that the main conclusions still hold after avoiding the potential for current exports to affect previous trade determinants. We can also see that our trade costs measurements (including empire) have a robust effect on exports, which persists at least for one period ahead.

Table 4.8: Japanese Exports Determinants (Lagged Independent Variables).

	(1)
VARIABLES	EXP
GDP	0.280
	(0.295)
RELPRODUCTIVITY	0.480*
	(0.270)
RELWAGES	0.160
	(0.145)
GDPCAPABSDIFF	1.098**
	(0.439)
POPDENSITYDIFF	0.536***
	(0.144)
FREIGHTS	-0.173
	(0.222)
TARIFFS	0.105
	(0.187)
EXCHCONTROL	-2.028**
	(0.871)
EXCHRATE	-0.676**
	(0.280)
IMPORTS	0.698***
	(0.186)
COLONY	4.015***
	(0.902)
FUTURE CONQUESTS	1.114***
	(0.395)
DIPLOMATS	0.381**
	(0.164)
Constant	-8.062*
	(4.818)
Observations	632
R-squared	0.738

Note: *Standard errors are clustered by country. Time dummies and the rest of controls included on previous regressions are accounted in the calculations, but are excluded from the results display.*** p<0.01,** p<0.05, *p<0.1*

4.7. Conclusions

Trade blocs in the interwar years were used as instruments of imperial power to foster exports and as a substitute for productivity in encouraging industrial production. In that sense, Japan's total exports in 1938 were between 28% and 47% higher thanks to imperial mechanisms. The figure is much higher when we capture the imperial effect on high-skill exports (between 66% and 76% higher thanks to imperial connections). Furthermore, the present research has also found that the trading bias created inside the Japanese formal and informal empire was much higher than those obtained by other authors in other territories during the same period.[59]

We have assumed here that the imperial shadow of power in interwar Japan predicted the regional trade bloc formation of 'The Greater East Asia Co-Prosperity Sphere'. Although this bloc was achieved only through military intervention in the 1940s, it began working through specific previous economic networks and imperial soft power that fostered regional exports in East and Southeast Asia along the period. This is perfectly illustrated by Manchuria colonization and, for that reason, the last chapter will provide a more in-depth study of the specific role of Japanese companies (Zaibatsu), which, in concert with strategic military measures, profited from colonization of Manchuria during both the informal and the formal imperial stages.

Japan was a latecomer to 20th-century industrialization, but during the interwar years, and especially in the 1930s, was able to activate a complex an aggressive industrialization policy to foster the modernization of its industrial production. That policy consisted of overlapping of protectionist import substitution and imperial systems to stimulate domestic production and industrial exports in its region of influence. That new strategy reshaped previous Japanese export specialization patterns, based on exporting low-skill manufactures to poor countries in the region with similar demand preferences and climatic characteristics. Previous networks of distribution created in old and future colonies were reinforced and followed by an investment of transport and communication infrastructure to foster the demand for steel, mechanical engineering machinery and other new manufactured products. We proved that this expansion occurred even before annexation and not forced by international trade bloc diversion in the 1930s. In that sense,

[59] See Appendix B.

we can identify a dual relationship between Japanese economic imperialism and military imperialism which will be addressed on the final chapter of this dissertation.

We are aware that a potential endogeneity problem exists that relates to import dependence or bilateral trade connections with military interventions (Bonfani & O'Rourke, 2014). Nevertheless, we believe that these results reasonably prove the colonial trade bias mechanism used by imperial institutions, inversely related to productivity, to support Japanese industrialization in the first half of the twentieth century. The market potential for high-skill manufactures was minimal and colonial intervention, therefore, was used to expand the market of the most intensive human capital sector of Japanese industrialization. The implicit counterfactual hypothesis would be that without imperial intervention in the region, Japan would not have expanded its high-skill exports and would not have exported such a variety of new products. In other words, Japan's industrialization was supported by imperial expansion, confirming that the Japanese ascendancy over East and Southeast Asian regional integration was sustained on its strong influence over the origins of intra-regional specialization patterns. Nevertheless, we still have to determine whether the intentions of colonizers were truly developmental or if they acted on behalf of the interests of certain Japanese elites.

5 CHAPTER 4: WINNERS OF JAPANESE COLONIZATION IN MANCHURIA 1907-1945

5.1. Introduction.

Chapter 3 has shown that Japanese military conquest was anticipated by prior economic penetration of Japanese business on neighbor territories. It has also demonstrated that Japanese industrial expansion and the subsequent intra-regional specialization it generated were linked with Japanese imperial aims. Nonetheless we still have to uncover the intentions of Japanese elites behind the colonization of neighbor territories for trying to finally close the debate about the singular developmental character of the Japanese Empire.

In order to do that, we have to describe the exchanges between ruling and economic elites that took place during Japanese colonization of Manchuria. Those interactions have been widely surveyed by academics across history all over the world and we can deduct that the separation between State and business has not always being clear as can be appreciated in the establishment of public corporations. Even nowadays, in the era of multinationals and the mindful companies, the State is an important player that must be taken into account (Mayer, 2018). For example, the growing influence of multinationals on country specific competition laws is being analyzed by scholars claiming that it can undermine productive capacity and welfare all over the world (Phillippon, 2019).

Therefore, we believe that the understanding of these interactions is fundamental for achieving a precise perception of economic landscapes across history, where we've found that colonization and rent seeking by states where at the roots of early corporations. There we can find for example the foundation of Royal Companies on the 17th century for discovery and trade promotion or public corporations created by parliamentary acts for the construction of railways and infrastructure. Closely related to them, this article will study colonial corporations, focusing its attention on the Manchuria colonization by Japan whose institutional setting however differs from the classical examples.

Japanese economic interests on Manchuria materialized in the Russo Japanese War (1904-1905) whose aftermath gave Japan control over the Kwantung Leased Territories and the South Manchurian Railway Zone (SMR Zone) in the southern part of the region. In order to colonize those territories Japan created a semipublic company named South Manchurian Railway Company (SMR Co.) based on the British East India Company's functions, activities and economic structure. This more classical system in which economic penetration prevailed over strategic objectives also favored Old Zaibatsu like Mitsui Co.

which profited from distributing food and raw materials to Japan and lasted until 1932 when Japanese conquered the whole Manchuria.

A consequence of this occupation was that Japan had to consolidate its dominion over a vast territory and the control of the newly established Soviet frontier became essential. With this objective the Kwantung Army gained the leadership in Manchurian affairs and the Japanese colonization model started to divert from the British becoming closer to the Soviet or Fascist ones. As an example, the SMR CO. started to lose relevance and after 1937 was substituted on its role of developer by another semipublic company which in this case aligned with the military interests as it was the new version of Nissan, denominated Manchuria Heavy Industrial Development Corporation (MHID Co.). In addition, the Old Zaibatsu were set aside from the profits of industrialization as a consequence of the military latent anti capitalism. All in all, this new stage responded to Kwantung Army's eagerness of transforming the region into a self-sufficient industrial base for military purposes, in which basic metals and chemicals production were going to play a leading role. It is easy to figure out that the main beneficiary of this new policy was the newly created MHID Co. who largely controlled both strategic sectors thanks to bilateral exchanges practiced with the military elites.

Obviously this new colonization strategy was meticulously designed and the core of this plan consisted on ensuring a cheap transportation of industrial products towards the Soviet frontier with which the Kwantung Army held strong animosity. Under this motivation, South Manchurian Railway Company's operation became captured by the Kwantung Army for military reasons as reflected by sharp reductions experienced on transport freights after 1935, a period in which the company held a monopolistic position. This capture and the extraordinary benefits it rendered to strategic sectors under the control of military friendly MHID are used in this paper to demonstrate that exchanges on this second colonization stage mostly aimed at satisfying military objectives.

In addition, we use this capture to demonstrate that those military plans were not limited to Manchuria but required machinery supplies from Japanese exporters. In that sense, the degree of influence that the military exercised over Imperial Japan's economic plans is going to be demonstrated by showing the correlation between price controls over SMR Co., raising production of Heavy industries in Manchuria and Japanese machinery exports to its colony. They will be checked through the construction of diff in diff models which cover this militaristic period between 1932 and 1941.

In sum, Japanese colonization of Manchuria was characterized by bilateral Business-State interactions, maintained during informal and formal imperial stages. This is appreciated on the prevalence of a model in which public benefits are granted to certain businesses at their own benefit, in exchange of performing determined administrative tasks and having to be subject to specific government involvement on company's decision making. The prime example of this model coined as Elite Exchange was the British East India Company and this paper is going to show how this model applies to interactions between Japanese Government and the SMR Co. first and between the Kwantung Army and the MHID Co. lately.

In view of the above, one of the biggest contributions of the present article consists of adapting this literature of State Capture which was engendered on the analysis of national markets to a colonization setting. Our hypothesis is that Elite Exchange frameworks are the ones that better fit the interaction between business and political elites during colonization processes. This concept aimed at reconciling two opposing models like those of State Capture and Business Capture and its pervasiveness during Manchuria colonization demonstrates that Japanese empire-wide industrialization required cooperation between businesses and rulers. Similarly, we contribute to the literature of Japanese historical economic development by demonstrating how during the 1930s economic and business outcomes were designed by the military elites which many times imitated Stalin's command economy. Such military dominion during the culmination of the colonization process is the definitive evidence against theories supporting a singular developmental nature of the Japanese Empire: before the 1930s colonial policies were more favorable to economic growth but were not singular since they resembled those of the British at other territories. Afterwards, we demonstrate that Manchuria industrialization was subject to Japanese warfare needs in the style of Nazi or Soviet Total War models.

In order to confirm these hypothesis, section II will provide a theoretical description about the main features of State Capture models all over the world, section III will summarize exchanges between special companies and Manchurian elites during the colonization process and section IV will show the mechanisms by which the Military were able to capture the SMR Co. and how they used that power to foster an industrialization process that benefited specially MHID Co. Furthermore, section V will on the one hand describe the model constructed for demonstrating that basic metals and chemical production inside Manchuria and machinery exports from Japan were the main winners of

railway freight rates set by the Kwantung Army, and the data sources consulted on the other. Finally section VI will show the main results and section VII will conclude.

5.2. Theoretical Framework: Models of Business-State interactions across history.

Across history many scholars have studied Business-State interactions as a unilateral process in which companies are able to capture State regulations. The framework in this case is set by a scheme of supply and demand for regulation in which some firms were able to use public resources to improve their economic status (Stigler, 1971). Under this premises, some authors explain how during the last 20 years lobby capacity has been employed by dominant firms in the US to influence regulatory process and restrict competition (Gutiérrez & Phillippon, 2019).

This structure has also worked as a reference for many authors studying the transitional economies in the former Eastern Bloc countries where the beneficiaries of partial reforms have struggled to avoid further expansion of regulations, condemning the whole economy to permanent imbalances (Hellman, 1998). Other studies show how influential businessmen ended up controlling major Russian industrial firms and other sectors like banking and finance or oil and gas during the process of mass privatization and lastly the Government itself (Black et al.,1999, pp.1746-1750; Johnson. 2000; Lane, 2018). All in all, this phenomenon of private firms shaping State regulations in their own benefits was conceptualized under the term State Capture (Hellman et al., 2000).

This situation was however gradually substituted in Russia by a system in which the position of the State became stronger and enterprises started to work under the command of bureaucratic interests, leading to a phenomenon denominated Business Capture (Yakovlev, 2006). This framework can also be applied to predatory states in which rents from public companies are employed by the ruling elites for personal purposes as it happened with Nigeria's oil sales in the World market under Babangida and Abacha (Zalanga, 1996). Another example is found on 21st century rural China where local official's implemented reforms aiming to maximize rents extracted from rural business, thus deteriorating market environment (Zhang & Liu, 2010).

Nonetheless, Business Capture can also have positive connotations as it is the case of State-led development adopted after WWII by countries in Latin America, East and Southeast Asia and Africa which aimed at reaching industrial modernization through the control of business (Reed & Reed, 2009). Some successful examples of this control might be found in South Korea in which large conglomerates were exporting with very low profits

as a national service (Kohli, 2004). This last model differs from industrialization under the Japanese dominion in the smaller degree of state intervention by the Korean Government during the 1960s, which was eased by Japanese institutional, social and infrastructure legacy (Kohli, 1994). All of this fits those theories about higher degrees of state intervention observed during the industrialization of backward economies (Gerschenkron, 1962).

Lastly, both kinds of cooperation models are reconciled when State-business interactions are studied as a bilateral process. This system is denominated Elite Exchange in which certain companies are able to influence government decisions at their own benefit but are also subject to certain government controls in prices and decision making. The original model is applied to State-business interactions in post-Communist Russia, but we find that it could also be adapted to imperial dominion frameworks like the British or Nazi ones (Frye, 2002).

Certainly, those interactions overlap at both colonial and national frameworks as they respond to a country's interests, although in the former case they present an unequal relationship in which the richer country extract gains from the poorer at the expense of having to develop it. Scarce business capacity of acquired territories forces the creation of multinational companies acting on behalf of colonizer's interests as happened with the East India Company on the case of British India (Vaughn, 2009). The Elite Exchange is appreciated since the company exercised political and military functions on behalf of the British Parliament which supervised company's Board of Control, at the same time as it enjoyed commercial benefits from the Crown like a Monopoly over Indian trade until 1813 or the exclusive right to trade tea with China until 1833. The key difference with Business Capture is that in this case company's profitability and stockholders' returns significantly grow as a consequence of public benefits (the East India Company remained profitable until its dissolution in 1874) (Farooqui, 2007; Webster, 1990). Such a process can be also appreciated on the Dutch strategy with the Dutch India Company or in the French example which however employed a bunch of privileged French companies instead of funding semipublic multinationals for rent extraction from conquered territories (Gerstell, 1991; Tadei, 2013).

Opposing all of them, there were colonization models where the economic development of conquered territories was subjugated by strategic needs of conquerors. Their strategies consisted on a quick industrialization of the occupied territories in order to satisfy warfare needs. A prime example is Nazi Germany which didn't employ semipublic

companies to administer the economies of its conquered territories but transferred joint stock companies to the German Share Law Regime. This permitted the State to dissolve the companies if they went against the public welfare (Štolleová, 2018). In exchange, conquered companies benefited from German technical assistance and expertise or cheap labor of Jews forced by the German administration and enjoyed raises in production until 1943 due to Nazi's war requirements.

Lastly, the case of Japanese colonization of Manchuria, which is the one we are going to deal with, employed semipublic companies as drivers of exchanges with political authorities. Nevertheless the colonization strategy diverged across two differentiated stages: Early development (1907-1931) resembled the British model under the management of the South Manchurian Railway Company (SMR Co.) founded by Government decree, whereas late industrialization (1932-1945) responded to warfare needs as in the case of the Nazi conquered territories during the same period or the Soviet ones after WWII and was coordinated by Nissan in cooperation with the Kwantung Army.

After all, this paper contributes to the literature of State Capture by adapting this national framework to a context of colonial dominion and conquests. In that aspect, the main feature under those circumstances was the bidirectional character of exchanges present in British, German or French imperialism and which according to our main hypothesis also applies to Japanese colonialism.

5.3. Winners of colonization: Strategic industrialization and Elite Exchange

Once the theoretical model has been set, the following section will analyze the process of colonization in Manchuria, paying special attention to the set of interests presented by the different ruling elites and the cooperation mechanisms established between them.

5.3.1. Why Manchuria? Japan economic and strategic objectives.

Japanese soldiers put their feet on Manchuria for the first time in 1894 during the Sino-Japanese War fought for the control of resource rich and strategically located Korea (Fung, 1996). Nevertheless, the control of Manchuria has been an old aspiration of Japanese officials as it was reflected in 1904 by the occupation of Port Arthur by Japanese soldiers aiming to defend empire's position in Korea and originating the Russo-Japanese War. The aftermath of this conflict brought the Japanese Empire the control of the Kwantung Leased Territories and the South Manchurian Railway Zone. As it can be

appreciated, the reasons that the Japanese Government had to invade Manchuria varied between economic and strategic, with the former prevailing until 1931.

First of all, Japan tried to imitate the imperial frameworks created in the region by the Europeans, with the precise objective of self-development in order to avoid foreign conquest of its territory. For that reason Manchuria, as well as Korea and Taiwan had to be a supplier of raw materials like fuels, ferrous minerals or food staples like soya bean cake and a consumer of Japanese manufactures (Reardon-Anderson, 1986; Webster, 1990; Young, 1928; Grajdanzev, 1945). Such a colonial objective was firstly impulsed by demographic pressures since at the start of the 20th century Japan was facing difficulties to feed its growing population. In that sense, Manchuria annexation could facilitate Japanese immigration to a territory which was not densely populated, relieving Japan's excess population (Alder, 1991)

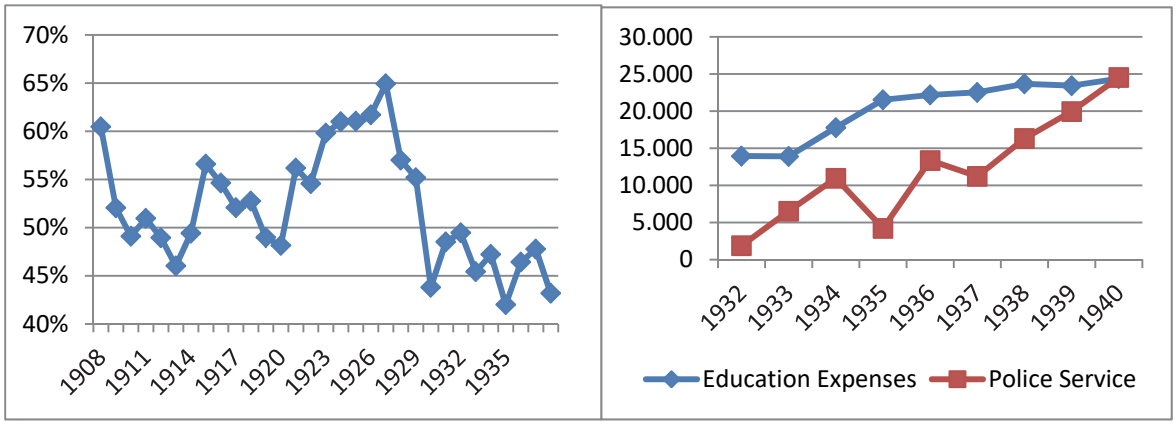
At this point many Japanese firms started to develop an economic interest in Manchuria and funded enterprises there in order to better supply Japanese migrants (Yasuyuki,). They were precisely those investments and Japanese textile commercial interests the ones that fostered Japanese Government intervention in Manchuria economic affairs by investing in transport infrastructure and financial development with the objective of market enlargement (Bix, 1972). The Japanese also invested in education trying to increment public legitimacy of the new regime and wishing a prepared and loyal base of public servants (Kohli, 1994; Hall, 2004). At this stage, that fits the informal empire characteristics mentioned on the previous chapter, imperial targets resembled those of British colonialism whose policies attended to industrial capitalists, landowners or financial sector interests (Cain & Hopkins, 1986, 1987; Gallagher & Robinson, 1953).

Nevertheless, this strategy shifted after the Mukden incident in 1931 which gave Japan full control over the whole Manchuria (Murakami, 2012). In that sense, the huge enlargement experienced by Japanese dominions in North China (they changed from 3 to 1300 km^2) carried increasing tensions with Soviet rivals, whose menace and proximity already motivated Japanese 19th century's imperial expansion. The new conquest augmented the relevance of strategic and warlike considerations in Manchurian decision making as it could be reflected on the substitution of the Japanese Government by the Kwantung Army as rulers of the region or the establishment of railway connections between Japan mainland and the Soviet frontier evidence this new strategy (Yamamuro, 2006, pp. 25-29; Rodgers, 1942). Frontier's security and northward expansion towards

Siberia natural resources became a priority for the new rulers who started to draw Five Year Industrialization Plans for trying to shorten the gap in munitions between the Japanese Empire and the Soviet Union (Okazaki, 2013; Coox, 1990, pp. 1033-1094). This process meant the submission of a whole economic system to Total War, following precisely Stalinist policies established on the Soviet Union after 1928, which were then applied to its Central Asia and Eastern Europe internal colonies after WWII (Zinam 1972; Bunce 1985). Similar objectives were prevalent in Nazi Germany after 1936, which also exploited occupied territories to strengthen Reich's army (Klemann & Kudryashov, 2013, pp. 19-40)

As a conclusion Japanese development of Manchuria could be divided in two stages. The first one can be delimited between 1907 and 1931 and considered to illustrate informal empire mechanisms as it was driven by business interests. On the other hand, the second one refers to a formal colonization, lasts for 1932-1945 and is characterized by the military dominion of economic decisions and investments. In the end, it seems that the Japanese Empire was not particularly developmental in nature since Manchuria's colonization responded to the interests of Japanese elites, resembling British intentions during the first stage and the Soviet or Nazi ones during the second. In spite of the marked divergence between colonial objectives at both stages, the employment of semipublic companies as drivers of the process was maintained, although the identity of the political and business elites was modified. Figure 5.1 illustrates those two stages. On the left hand side we can appreciate how social development share (education plus Medicare) over total public expenditure on the SMR Zone rose substantially during the 1920s and was reduced after Japan full conquest in the 30s. On the right hand side we can appreciate how real educational expenses in Manchuria stagnated after 1935, while police expenditures rose remarkably. The employed mechanisms of Elite Exchange will be analyzed on the following sections.

Figure 5.1: Share of Social spending on SMR Zone public budget 1907-1937 (left) and police and education real expenditure in thousands of 1935 Manchoukuo Yuan (right)



Source: Asia Historical Statistics China.

5.3.2. Early Manchurian development: Exchanges between SMR Co. and the State (1907-1931)

When the Japanese won the War against Russia in 1905 they obtained the desired foot on China by receiving the Kwantung Leased Territories and the control over the South Manchurian Railway constructed by the Russians and its adjacent territories, both in Southern Manchuria. Those dominions were at first administered by the Japanese Government, which simultaneously exercised civil and military authority (Royama, 1930). At that time, the main business in this region was railway transportation and in order to manage it, the Japanese Government established the South Manchurian Railway Company under a decree.

It was considered a special company in the sense that half of its capital was provided by the Japanese Government in the form of railway assets confiscated from the Russians (worth 100 Million Yen) and the rest should be private. This equilibrium continued during the whole live of the company in spite of subsequent capital increases. Apart from public capital, the company received ownership of a very profitable line connecting the most important Manchurian cities. In exchange, the Japanese Government had the right to appoint the top executives of the company, thus ensuring state control over its actions. Furthermore, the SMR business plan should be approved every year by the Japanese Government (Noguchi & Boyns, 2013).

As explained before, Japanese profit extraction from its newly acquired colony and rising returns of private foreign investment required certain development of the territory's infrastructure and industrial base which had to be performed by the biggest company

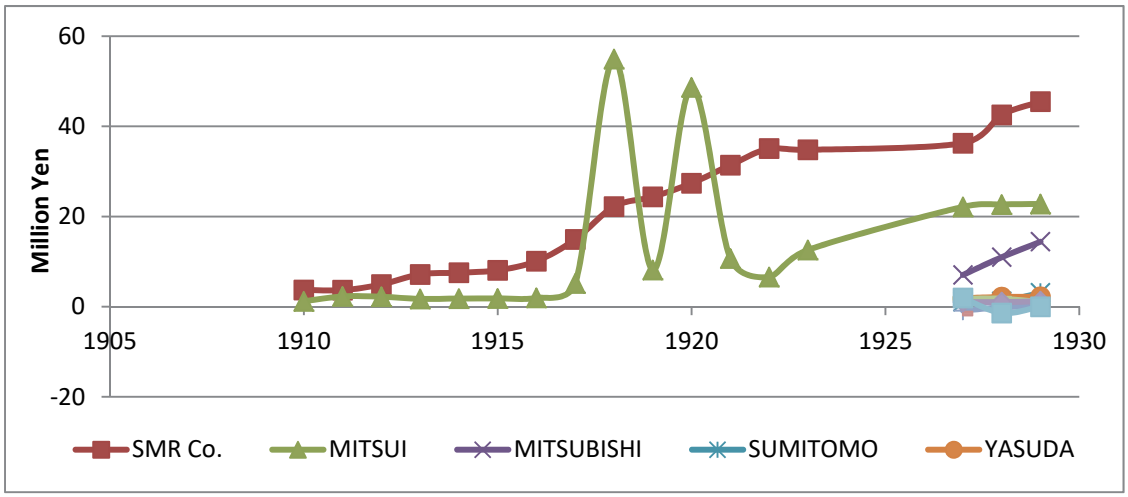
operating in Manchuria at that time, the SMR. That's why it started to be considered a Japanese version of the East India Company as it had to employ profits from the railway business (the most profitable one by far) in order to industrially develop Manchurian iron and steel, oil, flour milling, glass and chemical manufactures, electricity generating plants or coal mines (Sawai, 2017). In addition, SMR Co. also built public infrastructure like harbors or hotels and performed administrative functions (the ones generating biggest losses) like constructing and managing schools and hospitals (Takeo & Fogel, 2016). In exchange of implementing colonial policies in Manchuria, the Japanese Government offered the company a guaranteed 6% dividend and guaranteed payment on bonds issued until twice company's paid up capital (Iguchi, 2003).

In that sense, as it is appreciated on the evolution of profits depicted on figure 5.2, exchanges between the SMR Co. and the Japanese Government became beneficial to both of them and also to Japanese trading companies like Mitsui. This company dominated the lucrative extraction and distribution of soya bean, of which Manchuria was the world's leading exporter and such trade was remarkably enhanced by Japanese Government investments in railway and maritime transport infrastructure. This company actively cooperated with the SMR Co. and Japanese authorities, so we can consider this capitalist Old Zaibatsu to be the winner of this first colonization stage (Asajima & Smitka, 1985; Sakamoto, 1990).

Not even the appearance of the Kwantung Army in 1919 as the new military administrator of Japanese Manchuria and its acquired possibility interfering the company's decision making undermined its position, which strengthened vis a vis Russian (CER) and Chinese competitors operating in non-occupied Manchuria land. Nevertheless, nationalist policies implemented in China during the late 1920s started a campaign of unfair competition against SMR Co. operation which paradoxically was employed by the Kwantung Army as a pretext to invade the whole Manchuria in 1931 (Chou, 1971; Kingman, 1932). This action sets the first exchange between SMR Co. and the military elites, since its president helped the Kwantung Army on its diplomatic campaign in Japan looking for Government support for the occupation (Egler, 1977). In exchange the Army nationalized the former Chinese National lines and consigned them to the South Manchurian Railway in 1933, reducing competition to a minimum which became zero once Japanese Government purchased the CER from the Russians and also gave it to the SMR

Co. Nevertheless, this was going to be the last time in which cooperation between both elites proved mutually beneficial.

Figure 5.2: Profits of principal Japanese Zaibatsu (1907-1929)



Source: Asajima & Smitka (1985)

5.3.3. Consolidation stage: Kwantung Army captures the SMR Co. and MHID Co. raises (1931-1945).

After the Mukden incident in 1931, Manchuria was fully occupied by Japan and the Kwantung Army became the rulers of the whole territory, starting a period in which strategic purposes prevailed over business ones (Young, 1998, pp.183-241). In this regard, the Japanese military were very interested in the development of heavy industries and chemicals as well as munitions in order to close the gap with the Soviet Union, which was the main potential enemy for the Kwantung Army (Okazaki, 2013). With this purpose, the military started to exercise every time bigger influence over the SMR Co. as it can be appreciated for example on the meager increment experienced by the company's profits on a period in which it had obtained a monopolistic position over Manchuria's railway.

This in part could be explained by the acquisition of non-profitable lines like the CER but military intervention would also contribute since they obliged the SMR Co. to reinforce its railway facilities to enable a significant increment in the amount of military transportation. This raising transport volume was not accompanied by an increment on revenue because the military imposed a new price system by which freight charged per kilometer decreased on a distance base, thus reducing revenue per kilometer on long distance trips. One might expect that the State subsidized the company in order to cope with those changes and maintain the previously described equilibrium situation but it only

received a financial loan from the State of Manchuria aiming at increasing cargo capacity of trains and improving locomotives. The rest of required funds had to be raised from private sources (Noguchi & Boyns, 2013). That's why in this point we can be talking about the military capturing the South Manchurian Railway Company.

This new price system remarkably favored the industrial objectives of the Kwantung Army in Manchuria in the sense that it facilitated resource mobilization from Southern factories towards their final destination in the North where the military were preparing for a war against the Soviets. For example it permitted a sharp reduction in the cost of transport iron and steel to supply railway construction around the Manchuria-Soviet frontier in the North and Northeast or in the distribution of explosives and munitions produced at chemical and arsenal factories in Mukden (South) towards the frontier with the Soviet Union where Japan had to face the Soviets at different incidents between 1937 and 1939 (Ginsburg, 1949; Goldman, 2012). [60]

The rest of economic activities in Manchuria were not so benefited by this new pricing policy since sources of raw materials were next to iron and steel and chemicals plants and the main industries, mines and most productive agrarian fields were concentrated in the Southern region next to the main urban settlements (Avila-Tapies, 2013; Rodgers, 1948) and Murakoshi & Trewartha, 1930).[61] Furthermore, we show on appendix 5 how soya bean exports stagnated because of international repulse to the new Manchurian regime. That's why we argue in this paper that Kwantung Army's controls over SMR freights reflect the military interests on a rapid growth of iron and steel and chemicals production, which in Manchuria was dominated by Nissan as will be analyzed during the rest of the paper.[62]

Besides, the military strategy was not limited to Manchuria but also required for Japanese support in the form of technology and expertise. For that reason, the imposed pricing system over SMR railway was also designed for reducing costs of transport machinery from Japan to Manchurian factories (United States Bureau of Foreign and Domestic commerce, 1935, 1937, 1946). In fact, those new transport tariffs became very effective after 1937, when oil shortages produced after conflicts with China and the Soviet

[60] Armur River affair (1937), Changfuken incident (1938) and Nomonhan (1939).
[61] We should mention that there was also extensive agriculture on Northern Manchuria.
[62] In addition, it also benefited chemical production since it reduced long distance transport of sulphate of ammonia from the Southern factories to act as a fertilizer in the soya bean fields at Manchuria central plains.

Union forced a substitution of air or maritime transportation in favor of railway connections between Shimonoseki in Japan and Manchuria via Korea (Matsusaka, 2020, pp. 145; Harada, 1993). See Appendix C for further detail on the mechanisms linking SMR freights, production in Manchuria and exports by sector.

After all, Kwantung Army policies favored a quick industrialization based on the production of basic metals and chemicals employing imported Japanese machinery. Military plans however required huge amounts of capital investments that the SMR Co. was not able to provide, the same as Japanese private companies who found no attractiveness on Manchuria's low industrial profitability and interventionist regulatory system. Apart from that, Kwantung Army's officers and the rest of bureaucrats in charge of Manchuria's economic design started to look for the economic advise of Japanese businessmen, recognizing their limited capabilities to coordinate the industrialization process (Iguchi, 2003, pp. 31-56). Consequently, the military had to negotiate with existing Japanese conglomerates and offer them strong incentives to coordinate the Five Year Plans' implementation since the foundation of a new special company from nothing as happened with the SMR was unfeasible. Notwithstanding, the military were still able to discard Old Zaibatsu like Mitsui or Mitsubishi whose familiar structure and capitalist spirit confronted with Kwantung Army's controlled economic system (Young, 2017; Kuramoto, 2018).

In that sense, New Zaibatsu like Nissan became better candidates since they didn't own private banks for obtaining financial resources and their structure was not based on the power of a single family since they had thousands of stockholders to which distribute business gains (Udagawa, 1991). Additionally, Nissan and other New Zaibatsu dominated heavy and chemical industries in Japan thanks to their investment in sophisticated technology after 1920s, whereas traditional Zaibatsu were more prominent in other kinds of industries (although they still dominated shipbuilding or electric machinery) which made them less interesting for the military. All in all, Nissan didn't need to lobby the rulers because it was the best possible candidate and its president, Yoshisuhke Ayukawa, was the uncle of Nobusiki Kishi, whose close relationship with Kwantung Army's officers granted him a position as director of Manchuria industrialization in 1935.

Nevertheless, Yoshisuhke Ayukawa, was not at first fully convinced by its nephew about cooperating with the military and the delicate financial situation of the company encouraged him to ask for certain conditions like the recognition from the Kwantung Army of the need to attract foreign capital, which would benefit Nissan relationship with

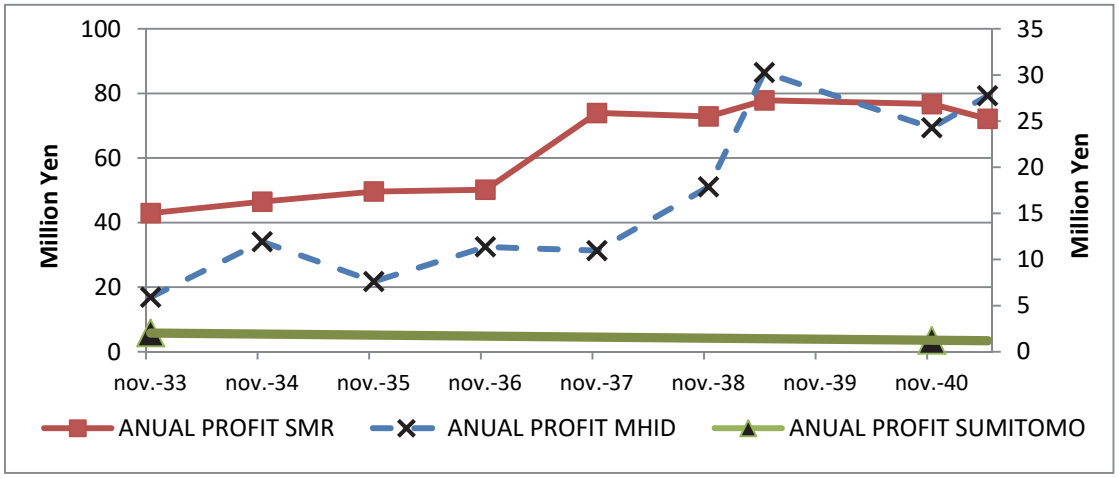
American capitalists. Nissan also asked for special fiscal treatment in order to avoid double taxation and relieve its financial distress. Apart from that, Ayukawa demanded a Nissan takeover of the SMR light and Heavy industries as well as its mining operations, which would represent the public contribution to paid-up capital of the special company in which Nissan was transformed, denominated Manchuria Heavy Industry Development Company (MHID Co.). The desperate situation faced by the military forced them to accept all Ayukawa petitions and to also guarantee a return of 6% on investments in Manchuria for the next 10 years and increments on Nissan's stock liquidity supported by the Japan Industrial Bank. In that sense, it is easy to conclude that the circumstance surrounding this second colonization stage granted MHID Co. bigger benefits in 1937 than those given to SMR Co. 30 years earlier and it is reflected on the evolution of the company's profits during the second half of the 1930s depicted on figure 5.3. The fact that they substantially grew at a time in which the SMR Co. benefits stagnated and Sumitomo ones decreased might reflect that cooperation with the military made this New Zaibatsu the greatest winner of this second colonization stage.

In conclusion, the literature suggests that business penetration in Manchuria was linked with Japanese public interests as it is derived from bilateral exchanges between special companies and ruling elites: The first one took place before full annexation and business interests were given priority, thus benefiting trading companies like Mitsui & Co. and specially the semipublic South Manchurian Railway in charge of Japanese colonization of Manchuria. Afterwards, the Kwantung Army took control of the economy to the detriment of the SMR Co. trying to transform Manchuria into a munitions supplier through the establishment of Five Year Plans. This strategy imitated the Soviet command economy which even included manipulation of transport freights in order to foster the establishment of certain militarily essential industries (Zinam, 1972; Okazaki, 1994). Its implementation could only be executed through the supply of public incentives, which benefited Nissan thanks to certain personal connections that conceded the role of implementer of these plans and new headquarters in Manchuria (MHID Co).

In the end, Manchurian economic development responded exclusively to the interests of different Japanese elites, which might be at odds with the kind views that many scholars have regarding Japanese imperialism. After proving the mechanisms of Elite Exchange that shaped Japan's rule over Manchuria, the rest of the article will analyze the

prevalence of Japanese national interests over Manchurian economic settings, looking for evidence of the military management of industrial policies during the 1930s.

Figure 5.3: Annual Profits of SMR Co.(left axis), Nissan and Sumitomo (right axis) 1933-1941.



Sources: See text.

5.4. Descriptive Statistics: Interactions between Business and the State

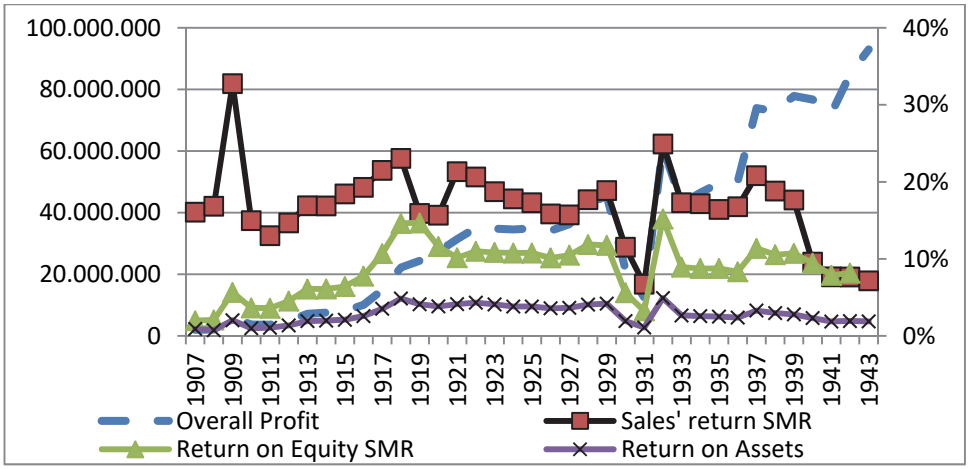
As we have explained on the previous section the SMR Co and Mitsui obtained big profits from its cooperation with the Japanese Government during the first 20 years of the colonization process, although the former had to pay certain costs. After that the SMR became subject to military interests which benefited Nissan. All those cooperation mechanisms will be depicted on the following section.

5.4.1. SMR Co. and State Control

First of all we can see in figure 5.4 how the company's overall profits rose substantially during the whole colonization process with the short exception of the first years of the Great Depression. In fact the SMR Co. was one of the most profitable railways in the world because it linked the political and economic centers of Manchoukuo and monopolized cargo shipment through its feeder lines. Those results evidence the benefits received by the company from the Japanese Government. Nevertheless the figure also shows that profits increased because the size of the company rose during the colonization process not because its investment or commercial activities became more profitable since none of the variables used to measure profitability experienced any significant raise after during the interwar years and all present a decreasing tendency after 1931, especially acute after 1937. Assuming that the evolution of profitability shown in figure 5.4 is fully explained by the interactions between the company and the State is too simplistic, but it

seems that the raise on profitability experienced during the early years of the company and the reduction during the 1930s were influenced by the state control over the company.

Figure 5.4: SMR Overall Profit and Profitability (1907-1944).

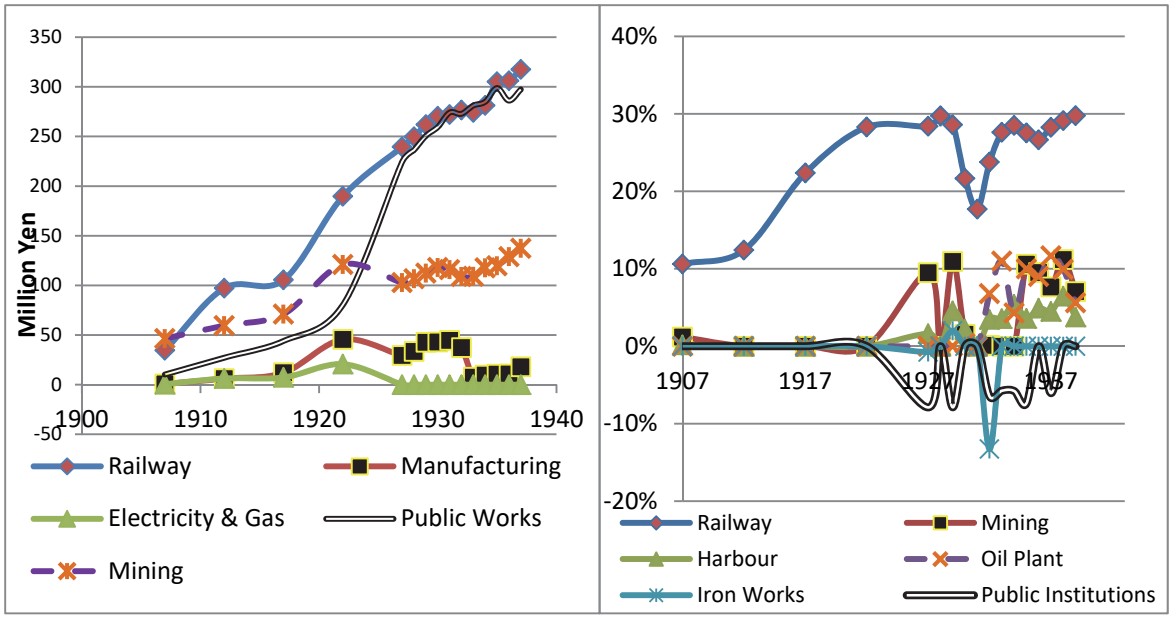


Source: Reports on Progress in Manchuria (various volumes) and Noguchi & Boyns (2013).

For example, figure 5.5 shows that the most profitable investments performed by the SMR Co. were railways, whose benefits per unit of capital rose substantially during the first decades of the company's operation. However, at the same time the State called for investment on other sectors considered essential for Manchuria colonization like iron works, oil plants or mining, which took lot of time to become profitable. Moreover, during the 1920s the company's second investment was public infrastructure and administration which generated enormous losses. In fact, as appreciated on the figure below, public administration investment was quite similar to investment on railways despite of their lack of profitability.

During more than 20 years, those exchanges between the SMR Co. and the State that characterized the developmental stage proved to be beneficial for both parties as it is reflected specially on the increasing profitability in railway investments until 1929. Nevertheless, the growing military intervention during the 1930s and the new strategic approach to Manchuria colonization undermined company's profitability. This fact became more evident after 1937 in which railway's profitability stagnated in spite of the monopolistic benefits enjoyed after receiving from the Kwantung Army the control of all Manchurian railways.

Figure 5.5: SMR Co. investment by sector (left) and profit per unit of capital invested (right) 1907-1938.



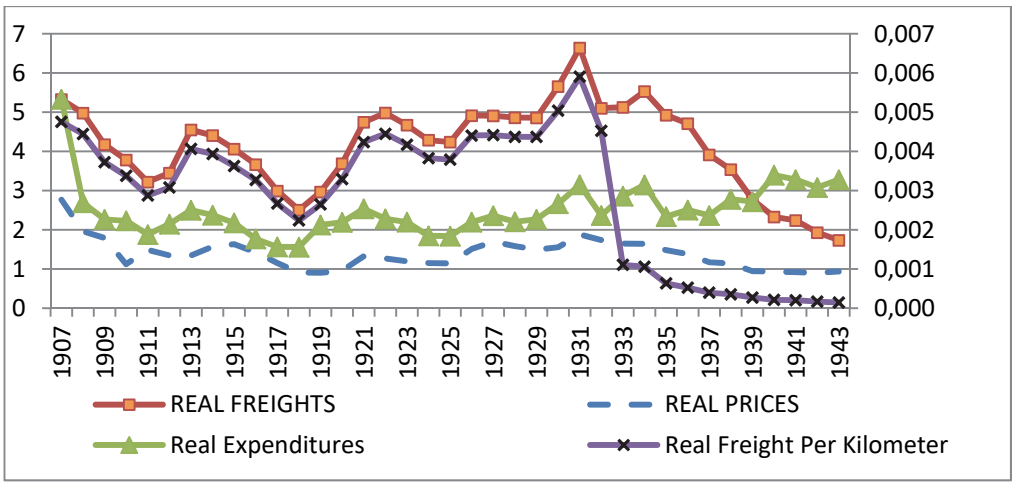
Source: Reports on Progress in Manchuria (various volumes) and The Japan-Manchoukuo Yearbook.

This phenomenon could be explained by the fact that the newly acquired railways (Chinese National Railway in 1932 and Russian China Eastern Railway in 1935) generated losses to the overall SMR since their operations were unprofitable. Nevertheless those acquisitions went hand in hand with an increment in transport volume thanks to military demands which should compensate losses generated by new lines, but which surprisingly coincided with a collapse of the company's markups.

The main reasons why rising transport volume didn't generate higher profitability are found at the evolution of costs and prices set by the company on behalf of the Kwantung Army. During 1930s SMR nominal fares slightly increased, but they did in a very modest way compared with raises in coal and personnel costs. This is reflected in figure 5.6 where railway expenses per Ton in 1935 Yen incremented during 1930s at the same time as real income decreased substantially. This reduction most clearly affected merchandise transportation which was considered vital for military interests. Moreover, we can appreciate the scope of the Army's pricing system when we approximate the evolution of revenue per ton per Kilometer of railway constructed, whose collapse in the 1930s is much more evident than the one experienced by overall prices. Such relevant drop reflects that Manchurian railway network expanded faster than income per unit shipped, in line with warfare requirements. For that reason SMR transport freights are going to be considered an

instrument of military power inside Manchuria. The next paragraphs are devoted to study which sectors and companies became more benefited by this control.

Figure 5.6: Average Prices Charged by SMR on Passenger and Freight Transport compared with expenditures in 1935 Yen per Ton (left) and Real Freights Per Kilometer Of Railway (right) 1907-1943.

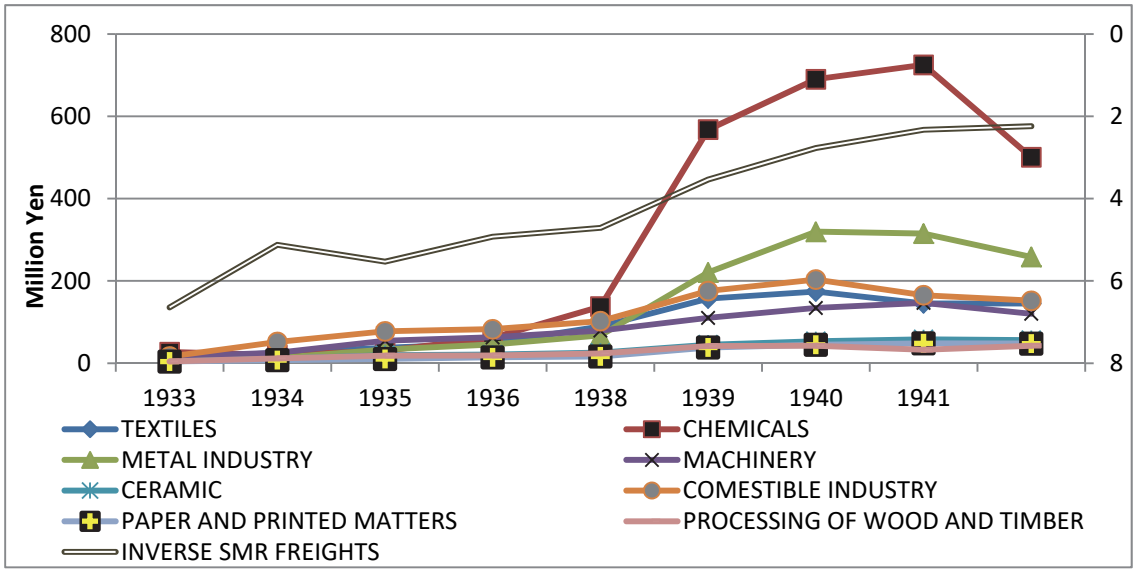


Source:1908-1930 The Manchuria Yearbook 1931. 1931-1937 Reports on Progress in Manchuria 1939. 1938-1943 Noguchi & Boyns 2013

5.4.2. Beneficiaries of SMR capture inside Manchuria

In order to do so we will first study the evolution of production in Manchuria, which during the 1930s was dominated by Japanese companies. What can be appreciated is that production (in 1935 prices) rose substantially after 1936 as a consequence of the Five Year Plans. In any case, the sectors experiencing a biggest raise during the years of price controls (reflected on the inverse of real freights) were chemicals and basic metals as shown on figure 5.7 and table 5.1. The last one reflects precisely results of those regressions in which the dependent variable is production of each sector and independent one are SMR real freights. The biggest coefficients are presented by production of basic metals (iron and steel mainly) and especially chemicals, suggesting once again that those sectors were the main beneficiaries of SMR reduced fare.

Figure 5.7: Production of Japanese Companies in Manchuria (1935 prices) and SMR freights (inverse right axis).



Sources: Freights (See Text). Production (Asia Historical Statistics: China)

Table 5.1: Coefficients of Regressing SMR real freights on Production by sector (1931-1941).

SECTOR	COEFFICIENT
Textiles	-0.812
Ceramic	-0.764
Chemical	**-1.1318**
Comestibles	-0.6836
Machinery	-0.6779
Basic Metals	**-1.0673**
Paper	-0.8031
Wood	-0.6674

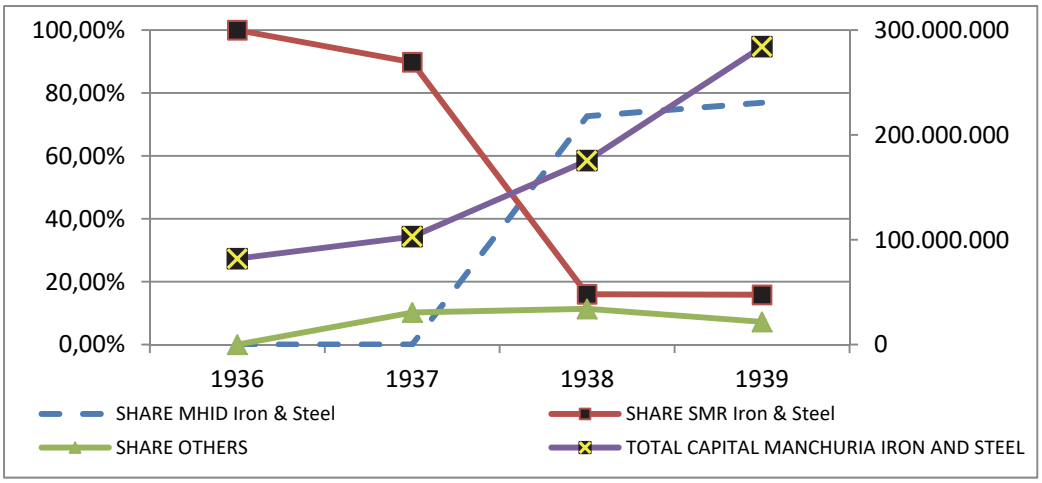
Own calculations performed by Excel. Source: (Asia Historical Statistics: China)

If we perform this analysis at company level we should bear in mind that both sectors worked on a system of oligopolistic competition, were Nissan was the clear domineering. For example the leading companies producing Iron and Steel in Manchuria were Penhsiu Iron Works, Anshan Iron Works and Tohendo development Co. whose major stockholder during the late 1930s was the MHID (Pauley, 1946).[63] This dominion becomes also evident in the following graph in which its share over total investment in the sector

[63] A control between 40 to 100% of paid -up capital according to

rose enormously after 1937 (reaching 80% of the total), precisely the years in which bigger investment was devoted to the production of Iron and Steel. This was of course possible thanks to its new privileged position obtained through exchanges with the military. Chemicals production in Manchuria was more diversified than the one of basic metals, but MHID still controlled Acid and Alkali production through its subsidiaries (United States Strategic Bombing Survey, 1946).

Figure 5.8: Share MHID and SMR over Japanese Paid Up Capital and total investment on Manchurian Iron (1936-1939).



Source: The Japan-Manchoukuo Yearbook (various volumes)

Furthermore, apart from the analysis of producers it is interesting to see how those military policies affected Manchurian traders by studying the evolution of imports to mainland. This sector was dominated by Mitsui Co. which as seen previously was one of the main winners of the first colonization stage. On the second one, however, the jump on comestibles and raw materials (soya bean mainly) exports to Japan was not enough to offset the sharp reductions experienced by Manchurian exports to Western countries which were Mitsui main customers. In addition increments on Mitsui dominated imports were very modest compared with the analyzed raises on production enjoyed by Japanese manufacturers operating in Manchuria, so we can conclude that this company was among the main losers of the formal colonial stage. [64] Lastly, we should also notice that those increments on production were not matched with raising industrial exports to Japan since

[64] See appendix C for further information regarding the decay of soy bean exports on this second stage.

Five Year Plans failed at attaining the desired production surplus required to increment chemicals and metals exports to Japan (Miwa, 2015,pp303-304).[65]

All in all, if we analyze the evolution of production generated by Japanese companies in Manchuria we can conclude that the newly created Manchuria Heavy Industrial Development Company was the main beneficiary of this new price system imposed by the Kwantung Army on SMR Co. freights thanks to bilateral exchanges between the company's President and Manchuria military elites illustrated on the previous sections.

5.4.3. Beneficiaries of SMR Capture inside Japan.

As mentioned earlier, these price controls didn't only benefit companies operating in Manchuria. Japanese exporters also got rid of cheaper land transport in order to raise their sales to Manchuria. Indeed, most sectors raised their exports (all but comestibles), although according to our provisional regressions the one reacting the most to SMR price controls was machinery as shown in table 5.2. In this case sector division has been performed using SITC Rev 2 because data comes from a trade database.

Table 5.2: Coefficients of Regressing SMR real freights on Exports by sector (1932-1938).

SECTOR	COEFFICIENT
Comestibles	6.9006
Tobacco and Beverages	-1.719
Crude Materials	-2.7518
Fuels	-2.2858
Animal and Vegetal Oil	-3.1146
Chemicals	-4.3602
Unfinished manufactures	-2.906
Machinery	**-5.2614**
Finished Manufactures	-3.3802

Source: Freights (See text), Exports (Annual Returns of trade of the Empire of Japan 1932, 1938))

We can appreciate on the appendix C that the main Japanese machinery exports at that time were in the form of railway and transport equipment, electric and industrial machines. Those sectors were more diversified in Japan than chemicals and metals in

[65]See appendix C for additional information regarding Manchurian exports to Japan.

Manchuria, but still favored a bunch of producers among them we find Nissan through its control of Hitachi Ltd.

In conclusion, this section has depicted the main mechanisms of Japanese control over Manchurian economic outcomes. More specifically, we've shown that Nissan (MHID Co.) was the main beneficiary of the military regime established on Manchuria during the 1930s, while SMR Co. and Mitsui suffered its consequences. This could be a sign suggesting that the military activity was more favorable to New Zaibatsu than old ones.[66] More importantly, we've suggested that the business outcomes of the Japanese Empire were subject to warfare needs, an idea that we will try to demonstrate in the following section and which would definitely deny the developmental character of Japanese rule over Asia.

5.5. Model and Data sources

Results obtained in the previous section suggest that inside Manchuria the main beneficiary of SMR freights reduction promoted by the Kwantung Army was the production of iron and steel and chemicals. This fact reflected the priority given to military strategic objectives on the second colonization stage that prioritized cheaper transportation of railway construction equipment and chemical explosives towards the Soviet frontier. Manchurian production in those sectors was dominated by Manchuria Heavy Industrial Development after agreeing with the Kwantung Army to establish its headquarters there. This company, across with other Japanese conglomerates, also profited from the substantial increase of Japanese machinery exports to Manchuria associated to freight controls. The objective of the present section is to confirm the hypothesis of military dominion over Japanese imperial economic affairs imitating Stalin's policies. It will be done by demonstrating that the most favored sectors from Army's control over railway fares were precisely those considered strategic for fighting the Soviets which in fact were controlled by a company closely linked with the Kwantung Army.

5.5.1. Model

In this model the dependent variable is going to be production by Japanese companies in Manchuria by sector "i" in period "t" between 1931 and 1941 in current Yen and the explanatory variable will be South Manchurian Railway company overall price of

[66] Old Zaibatsu: Mitsui, Mitsubishi, Yasuda and Sumitomo. New
New Zaibatsu: Okura, Furukawa, Nissan, Nisso, Nitchitsu, Mori.

transport per ton, expressed in 1935 prices. In order to see which sector was more sensitive to reductions in freights, the independent variable is going to interact with sector dummies, following the diff-in-diff dynamics. The model will be enlarged with variables controlling differences in prices, wages, each sector's past production and maritime transport costs across sectors and complemented with sector and time fixed effects.

$$Production_{it} = \beta_0 + \beta_1 lnfreights_{it} + \beta_2 Sector_i + \beta_3 lnfreights * Sector_{it} + \beta_4 Controls_{it} + \beta_t \quad \text{(EQ 5.1)}$$

A similar model is going to be employed in order to determine which sector in the Japanese economy experienced a biggest increment on exports to Manchuria associated with reductions in SMR Co. freights during the second half of the 1930s. The main differences are that in this case the dependent variable is going to be exports by sector and that the covered period will be 1912-1938 due to data availability, so instead of using time fixed effects we will divide our analysis in two for measuring the different colonization strategies. Finally, the model will be estimated through PPML so we can account for years or sectors in which exports were zero since there are no zeroes in our production database (Santos Silva & Tenreyro, 2006). This estimation procedure permits us to not take logs of the dependent variable, opposing the independent and controls which will be logged in order to interpret them as elasticities.

5.5.2. Data Sources

Information for constructing the variables explained in the previous section comes from a varied selection of sources. Regarding the dependent variable data refers to total value of production of Japanese firms operating in Manchuria disaggregated by sector. Data is expressed in current Yen and obtained from the Asian Historical Statistics: China volume. Production database is probably less precise and thorough than exports data, but it is the main novelty incorporated in this paper and we believe it provides invaluable knowledge.

Freights refer to total railway transport receipts in Yen divided by total freight traffic of SMR Co. in Ton. The resulting variable, freights in current Yen per ton is divided by the Manchuria Wholesale Price Index (1935=1) in order to find railway freight in 1935 Yen. Information for 1931-37 is found on (Reports on Progress in Manchuria, 1939) and for 1938-1941 it comes from (Noguchi & Boyns, 2013). The WPI for the whole period has been obtained from Asian Historical Statistics: China volume.

Additionally, some variables have been added to the model in order to control for sector specific characteristics that might explain why their production incremented more during the 1930s. In that sense, we control for the evolution of the market price of each product in order to measure their demand by using the Wholesale price index (1935=1). We also account for differences in workers' wages by sector in 1935 Yen in order to control for sector productivity. They are obtained by multiplying nominal wages in Manchoukuo Yuan per year by the exchange rate between the Yuan and the Japanese Yen and divide it by the average Manchoukuo WPI (1935=1). Another variable is the production by each sector on the previous year in order to control for those sectors presenting bigger production scale. Information for all those variables comes from Asian Historical Statistics: China. Lastly, we control for maritime transport costs from Japan since Japanese exports are a direct substitute of Japanese production inside Manchuria. In order to do this we obtain freight factor indices (cost of transport one Ton divided by price per ton) obtained on previous chapters.

The analysis of Japanese exports to Manchuria permits us to understand the integral nature of Japanese imperial policies after determining which sectors inside the Japanese economy benefited more from military objectives in Manchuria. That's possible because the database constructed in chapter 3 contains information regarding Japanese exports to Manchuria from 1912 to 1938 (not just for the 1930s as happened with production in Manchuria) disaggregated by product level (even 5 level digit disaggregation for some products). For that reason the dependent variable is going to be exports in current prices in 6 benchmark periods (1912,1915,1925,1929,1932 and 1938) at product level. Time dummies will be incorporated for each benchmark year and we will also add sector dummies which will interact with SMR freights in order to see which sector had a stronger correlation with them. The division of sectors in this case will be the one performed by the Standard International Trade Classification (we will look at the first digit) so we will have 10 sectors (from 0 to 9).

Once again, some variables are incorporated in order to control for other potential sources of export differences across sectors. Those variables are very similar to the ones employed in production since maritime freights are measuring trade costs between Japan and Manchuria, whereas Japan exports prices and wages by sector will approximate Japanese supply and demand characteristics. In order to measure the previous export scale

of every sector we are going to lag the variable as we did with production in the first regression.

Maritime freights are obtained on previous chapters while information regarding the rest of controls appear on (Ohkawa et al., 1967-1989) which includes data for Japan exports price index (1935=100), nominal daily wages in Yen (translated to 1934-36 prices using Japanese WPI) and Japan exports prices for a determined set of commodities. This information is adapted to our sector classification by assuming that the most exported commodity inside every sector represents the whole sector. See appendix C in order to check which commodity has been chosen to represent each sector.

5.6. Results

5.6.1. Production by Japanese companies in Manchuria.

Results interpretation should be done in a careful way. First of all, as can be appreciated on table 5.3 the relationship between SMR freights and production is negative, in the sense that reductions in tariffs experienced after 1931 were related with an overall increment in the production of Japanese firms in Manchuria. Secondly, the size of this impact is reduced at those sectors presenting positive and significant interactions, which were all but chemicals, basic metals and paper. Those three sectors show very low coefficients which are even statistically insignificant, suggesting that the enhancing effect of reduced railway costs was relatively bigger for them.[67]

Nevertheless, these results might be explained by certain peculiarities intrinsic to these sectors rather than by the military plans. That's why we add in column 2 variables that complement sector fixed effects in order to control these characteristics and results are maintained. A third concern with the results is that R^2 is extraordinarily high for a model in which few variables are included, which could reflect a low variation among our observations. This problem is not present on exports' regressions but in spite of it, we believe results to reasonably complement the story presented on previous sections as evidence of military control of Manchurian economy during the 1930s.

[67] We should notice that for example a one percent reduction on SMR real freights is associated with an increase of 3.9719% ((-3.986+0.0141)*-1)=3.9719) in production of chemicals and with a raise of just 2.516% in comestibles ((-3.986+1.47)*-1=2.516). In fact, a higher and significant interaction coefficient denotes a smaller impact of SMR freights on a certain sector production. See appendix C for further details on this overall effect.

In sum, this first regression confirms our hypothesis of military dominion over Manchuria industrialization by showing that chemicals and basic metals were the sectors most benefited from new SMR Co.transport fares. They were considered essential for fighting the Soviets and were dominated by Nissan in agreement with ruling military elites after 1937. Nevertheless, results also point that paper manufacturing benefited from these policies more than the rest of sectors. This last conclussion is however rejected on the appendix after calculating the margins of SMR real freights on production at every sector.

Table 5.3: Regression Results for Japanese Production in Manchuria (1931-1941).

VARIABLES	(1) PRODUCTION	(2) PRODUCTION
SMR FREIGHTS	-3.986***	-3.560***
	(0.387)	(0.744)
freightsceramics	0.920**	1.369**
	(0.443)	(0.552)
freightschemicals	0.0141	0.560
	(0.440)	(0.555)
freightscomestible	1.470***	2.001***
	(0.408)	(0.619)
freightsmachinery	1.246***	1.782***
	(0.429)	(0.537)
freightsmetal	0.0297	0.976*
	(0.378)	(0.586)
freightspaper	0.616	1.027*
	(0.423)	(0.593)
freightswood	1.429***	1.056**
	(0.478)	(0.500)
freightstextiles	1.035**	1.450***
	(0.405)	(0.510)
PRICES		-0.601***
		(0.215)
MARITIME FREIGHTS		1.206
		(0.853)
WAGES		0.482**
		(0.198)
LAGPRODUCTION		0.0803
		(0.0894)
Constant	21.85***	24.47***
	(0.381)	(4.733)
Observations	81	80
R-squared	0.987	0.992

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Sector and Time Fixed Effects computed but not reported on the table.*

5.6.2. Japanese Exports to Manchuria.

Information available on our exports dataset permits us to check how did SMR prices affect Japanese exports to Manchuria not only during the stage of military control but also on the previous one in which the company and Japanese Government cooperated for

economically developing the region. That's why the analysis will be divided in two time periods: the 1912-1929 period will represent the first stage whereas the 1932-1938 will illustrate the second one.

Results are confirming what we suspected on previous sections. The first period is a developmental one in which raises on freights set by SMR were linked with Manchurian prosperity. For that reason Japan exports to that region are increasing at the same time as railway transport prices incremented. This effect seems to be bigger for comestible exports to feed Japanese migrants and most importantly to machinery exports, which at this stage were characterized by an increment on light industrial machinery and transport equipment exports which tried to complement Japanese business investments.[68]

The period 1932-1938 is however one of reduced SMR tariffs due to military control and of increasing exports for most of the sectors, that's why coefficients are negative. Machinery is the most benefited sector since it was essential to complete industrialization planned by the Kwantung Army. In this period transport equipment became the main component and metal working machinery rose its share, suggesting that this new stage was more focused on heavy industrial development for military purposes. This conclusion is also obtained after adding the previously presented controls since we find that machinery is still among the sectors whose exports received a relevant impulse by military policies, although in this case beverages, fuels and raw materials were more sensitive to railway freights reduction. Anyway, those exports also complemented machinery ones (except for beverages) since most fuels were machine lubricants and a big part of raw materials exports were wood for railway construction. Furthermore, the performance of a Wald test confirms that the influence of freights over machinery exports is the same with and without controls, confirming that it was the most sensitive sector to this policy. See appendix C for further information.

As a summary, this section permits us to better distinguish the two different stages in Manchuria colonization by Japan, which are confirmed on the appendix through the performance of a Wald test showing that coefficients on the first period are significantly different to those on the second. We also demonstrate the influence of military plans over

[68] In order to measure the overall influence of SMR freights on every sector's exports we should add the coefficient for each specific sector to the general coefficient of SMR freights. For example in 1932-38 a 1% reduction in railway freights was associated with an increment of 8.276% on Japanese machinery exports to Manchuria. For further detail on overall effect by sector see appendix C.

Japanese exports structure during full occupation, which also benefited military friendly Nissan through its dominion over Hitachi Ltd. As a matter of fact, these results confirm the military dominion over decision making at imperial level and represent evidence against scholars considering the Japanese Empire to be naturally developmental.

Table 5.4: Regression Results for Japanese Exports to Manchuria (1912-1938).

VARIABLES	(1) 1912-29	(2) 1912-29	(3) 1932-1938	(4) 1932-38
SMRFREIGHT	9.237***	8.311**	9.384***	11.77***
	(0.239)	(3.948)	(0.391)	(2.472)
freightcommestible	-1.481	-0.394	-12.59***	-2.495
	(2.888)	(5.737)	(1.980)	(3.901)
freightbeverages	-5.584**	-8.696*	-11.42***	-14.44***
	(2.581)	(4.816)	(2.068)	(4.029)
freightcrudematerials	-6.248***	-10.78*	-15.57***	-17.03***
	(1.425)	(5.899)	(1.728)	(2.422)
freightfuels	-5.067**	-11.82	-11.93***	-14.95***
	(2.321)	(8.948)	(2.455)	(3.234)
freightvegetaloil	-5.298*	4.294	-13.69***	-2.747***
	(3.217)	(8.798)	(1.627)	(0.808)
freightchemicals	-3.201**	-4.302	-15.39***	-10.27***
	(1.375)	(5.233)	(1.233)	(1.818)
freightunfinished	-4.283***	-7.475*	-15.04***	-11.41***
	(1.227)	(3.841)	(0.893)	(1.303)
freightmachinery	-0.0696	1.079	-17.66***	-13.43***
	(2.053)	(6.906)	(1.211)	(2.961)
freightfinished	-5.320***	-11.39*	-13.66***	-2.019*
	(1.589)	(6.215)	(0.926)	(1.056)
WAGES		0.696		-1.666
		(1.494)		(3.073)
MARITIME FREIGHTS		-0.140		0.533
		(1.049)		(0.723)
PRICES		1.000		4.420***
		(0.800)		(0.839)
LAGEXPORTS		0.0265		0.127***
		(0.0620)		(0.0448)
Observations	5,064	1,505	2,532	1,394
R-squared	0.016	0.034	0.039	0.122

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Sector Fixed Effects computed but not reported on the table.*

5.6.3. Robustness Checks

The first controversy that arises with previous results is that the use of average real freights charged by SMR on railway transportation might not fully capture the change in

policies favoring distant trips. As explained before, this policy established lower prices per kilometer for longer trips and we believe this caused a reduction on overall railway freights. Nevertheless, the variable chosen in this paper might not fully reflect distance based curtailment established on behalf of the Kwantung Army and that's why in this regression we are going to approximate a measure of railway transport freights per kilometer. Bearing in mind that we don't have data for costs of transport per kilometer we will approximate it by dividing SMR transport freights in 1935 Yen per ton by total active kilometers of railway operated by the SMR at every year. This variable not only reflects the expansion of Manchurian railway network but also the increasing distance covered by SMR trains as a consequence of this northward extension, that was not accompanied by comparable raises in fares.

Conclusions under this new variable are very similar if we have a look at tables 5.5 and 5.6: Basic metals and chemicals are the most favored sectors by SMR pricing policy (although if we add controls we obtain that wood is also strongly affected) and machinery is the most sensitive exports sector at both stages, although after adding controls there are other sectors more influenced by this pricing policy on the second stage.

Table 5.5: Regression Results for Japanese Production in Manchuria using real freights per kilometer as independent variable (1931-1941).

VARIABLES	(1) No Controls	(2) Controls
SMR FREIGHTKM	-1.622***	-1.439***
	(0.265)	(0.427)
FreightKMCeramics	0.675**	1.122***
	(0.267)	(0.339)
FreightKMChemicals	0.0609	0.681
	(0.293)	(0.492)
FreightKMCommestibles	0.902***	1.490***
	(0.265)	(0.445)
FreightKMMachinery	0.828***	1.187***
	(0.261)	(0.300)
FreightsKMMetals	0.0998	0.821**
	(0.255)	(0.378)
FreightKMPaper	0.532**	0.978**
	(0.269)	(0.394)
FreightKMWood	0.893***	0.581
	(0.280)	(0.371)
FreightKMTextiles	0.677***	1.135***
	(0.258)	(0.365)
lnprices		-0.551***
		(0.176)
lnfreights		2.468
		(1.775)
lnwages		0.430**
		(0.174)
lagproduction		0.0557
		(0.0879)
Constant	4.848**	16.77
	(2.218)	(12.87)
Observations	81	80
R-squared	0.989	0.992

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

Table 5.6: Regression Results for Japanese Exports to Manchuria (1912-1938).

VARIABLES	(1) 1912-29 No Controls	(2) 1912-29 Controls	(3) 1932-38 No Controls	(4) 1932-38 Controls
SMRFREIGHTKM	4.225*	7.534	-0.0693	1.228**
	(2.431)	(6.849)	(0.457)	(0.482)
FreightsKMBeverages	-0.656	-8.012	-0.224	-3.805***
	(3.483)	(6.588)	(0.543)	(0.798)
FreightsKMChemicals	1.620	-3.799	-0.797	-2.930***
	(2.763)	(6.429)	(0.487)	(0.610)
FreightsKMCommestibles	3.290	0.0231	-0.394	-1.326***
	(3.691)	(7.189)	(0.536)	(0.393)
FreightsKMRawMaterials	-1.315	-10.23	-0.822	-3.457***
	(2.788)	(6.292)	(0.517)	(0.581)
FreightsKMFuels	-0.196	-11.08	-0.298	-2.643***
	(3.313)	(9.307)	(0.575)	(0.649)
FreightsKMUnfinishedManu	0.571	-6.663	-0.747	-3.297***
	(2.698)	(6.897)	(0.471)	(0.611)
FreightsKMMachinery	4.639	1.355	-1.125**	-2.452***
	(3.124)	(7.509)	(0.486)	(0.474)
FreightsKMrFinishedManu	-0.425	-10.80*	-0.547	0.118
	(2.870)	(6.556)	(0.473)	(0.295)
FreightsKMVegetalOil	-0.360	4.387	-0.551	-1.167***
	(3.941)	(9.137)	(0.510)	(0.367)
realwages		0.787		-2.571
		(1.829)		(1.572)
logfreights		-0.0305		-5.176***
		(1.509)		(1.008)
logprices		0.993		6.922***
		(0.811)		(1.385)
lagexports		0.0265		0.127***
		(0.0619)		(0.0448)
Constant	37.20***	54.66	14.29***	-7.532
	(13.56)	(36.87)	(3.187)	(5.785)
Observations	5,064	1,505	2,532	1,394
R-squared	0.018	0.034	0.045	0.122

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

On the other hand, another relevant concern regarding the previous results is the presence of endogeneity in the main independent variable. More specifically, the main source of such bias could be reverse causation in the sense that we are assuming that reductions on SMR freights are generating increments on production and exports, but causality might follow the opposite direction: Maybe increments in the scale of production and exports that need to be translated are reducing the costs of transport every ton as it is pointed by (Gatusso & Restuccia, 2014) or (Graham et al., 2003) when they deal with the concept of economies of traffic density.

The following section tries to avoid this problem and keep showing that the Kwantung Army controlled the industrialization process in Manchuria by substituting the dependent variable, SMR Co. real freights, by an exogenous variable that is not affected by the level of production or exports as it was the establishment of Five Year Plans for industrializing Manchuria by the Kwantung Army. [69] This is going to be a dummy variable whose value equals 0 before the establishment of the first plan in 1937 and 1 afterwards. As we've done previously, this variable is interacted with sector fixed effects in order to see which sector's production and exports were more favored by the establishment of this Five Year Plan. [70]

[69] Those plans looked for Manchuria industrial self-sufficiency so deceptive levels of manufacturing production could prompt the adoption of these plans. Nevertheless, those plans were not adopted until the Military confronted the Soviets for the first time in 1937, that's why we consider it as independent from production levels.

[70] A problem associated with this variable is that it is time-specific and not associated with geographic or sector differences but it still represents a turning point on Manchuria economic development lead by the military.

Table 5.7: Regression Results for Japanese Production in Manchuria using Five Years Plan as independent variable (1931-1941).

VARIABLES	(1) No Controls	(2) Controls
FIVEYEARPLAN	5.023***	7.065***
	(0.314)	(0.690)
FiveYearCeramics	-1.842***	-1.918***
	(0.310)	(0.428)
FiveYearChemicals	-0.658**	-0.503
	(0.332)	(0.491)
FiveYearCommestibles	-2.097***	-1.935***
	(0.310)	(0.436)
FiveYearMachinery	-2.057***	-2.319***
	(0.300)	(0.451)
FiveYearMetals	-0.939***	-1.013**
	(0.298)	(0.482)
FiveYearPaper	-1.579***	-1.694***
	(0.311)	(0.542)
FiveYearWood	-2.096***	-2.605***
	(0.323)	(0.455)
FiveYearTextiles	-1.763***	-1.730***
	(0.302)	(0.416)
PRICES		-0.288***
		(0.0766)
MARITIME FREIGHTS		-2.021***
		(0.359)
WAGES		0.0544
		(0.123)
LAGPRODUCTION		0.0470
		(0.113)
Constant	13.59***	
	(0.295)	
Observations	81	80
R-squared	0.993	0.994

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Sector and Time Fixed Effects computed but not reported on the table.*

Results are confirming our thesis of military dominion over the industrialization planning since metals and chemicals are the sectors enjoying bigger increments in production associated with the establishment of Five Year Plans established by the Kwantung Army in cooperation with Nissan and machinery exports from Japan were the most affected by these plans. This is appreciated with and without including additional variables, although once again machinery complements like fuels and raw materials appear remarkably sensible after adding controls. For further details on the specific effects of Five Year Plans on each sector's production and exports, see appendix C.

Table 5.8: Regression Results for Japanese Exports to Manchuria using Five Years Plan as independent variable (1912-1938).

VARIABLES	(1) No Controls	(2) Controls
FIVEYEARPLANS	14.84***	19.95***
	(0.757)	(7.051)
FiveYearsBeverages	0.430	0.916
	(1.026)	(1.293)
FiveYearChemicals	1.601*	0.875
	(0.914)	(1.077)
FiveYearCommestibles	0.846	-0.623
	(1.024)	(1.445)
FiveYearRawMaterials	2.072**	2.726**
	(0.935)	(1.307)
FiveYearFuels	1.086	2.804**
	(1.154)	(1.292)
FiveYearUnfinishedManu	1.029	0.975
	(0.913)	(1.231)
FiveYearMachinery	2.341**	2.490**
	(0.921)	(1.175)
FiveYearFinishedManu	0.727	0.358
	(0.910)	(1.011)
FiveYearVegetalOil	1.418	0.968
	(0.978)	(1.654)
WAGES		-0.780
		(1.326)
PRICES		1.802*
		(1.023)
FREIGHTS		1.210
		(1.320)
LAGEXPORTS		0.111***
		(0.0377)
Observations	7,596	2,900
R-squared	0.051	0.102

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Sector and Time Fixed Effects computed but not reported on the table.*

5.7. Conclusion

Recent concerns about multinationals capacity for influencing regulations, as well as successful examples of state led development strategies in East and Southeast Asia have generated a proliferation of studies about Business-State relationships. The present chapter aims to translate all those studies that refer to national markets to a colonization framework in order to show that Japanese business involvement on Manchuria was related with national interests. In that sense, we've been able to demonstrate that imperial industrialization was facilitated by profitable bilateral exchanges between the business and political and military elites across two differentiated stages.

Firstly, during the years in which Japanese dominions were only reduced to Kwantung Leased Territories and the South Manchurian Railway Zone (1907-1931) the most relevant ruling elite was the Japanese Government. On this informal empire stage, the settlement of Japanese business was aided by the Government and the SMR Co. in charge of improving transport and communications and directing territorial administration. All of this aimed to guarantee profitable investment for Japanese entrepreneurs under policies that were relatively developmental but were not original since they resembled the British ones. In exchange for these administrative and developmental activities, the company received important benefits from the State, although it was also subject to strong government supervision. In fact, those exchanges granted substantial increments on profits experienced also by trading companies like Mitsui which controlled the distribution of soya beans, Manchuria's leading export commodity.

After the Mukden Incident in September 1931 the whole Manchuria became occupied by Japanese troops of the Kwantung Army. This quick victory gave the military enormous popularity and the needs of controlling the Soviet frontier granted them Manchuria's rule. Of course the nature of the new rulers lead to a deep change on the political economy performed on this territory, which is deeply analyzed on the present paper. Strategic and military objectives became preeminent and the Kwantung Army launched a campaign of fast industrialization in order to equate Japanese arsenal with the Soviet, the principal enemy for this military group (1932-1945).

This campaign consisted on continuous increments in production of basic metals (iron and steel) and chemicals on Manchurian Southern factories which then were employed as explosives and railway construction materials in the Soviet frontier. In order to do this they required the support of railway infrastructure which was obtained through a progressive military capture of SMR Co. pricing policies that favored industrial shipments over soya bean transportation. On a parallel way, Manchuria industrialization required huge amounts of capital and economic expertise which were provided by a New Zaibatsu like Nissan, denominated as MHID Co. after its establishment on Manchuria in 1937 and which enjoyed personal links with the military. As it has been proof in this article, this company received important benefits from the Government in exchange for its administrative activity and capital provided on the industrialization, permitting MHID to become the largest beneficiary of Japanese industrialization of Manchuria. Last, but not least, this process also required the use of Japanese machinery and expertise which was exported to Manchuria

and which made clear that military influence was not limited to colonized territories but also affected economic activity on the homeland, rendering also substantial benefits to Nissan.

All in all, this business study of Japanese colonization in Manchuria contributes to the literature of State Capture by showing how colonial development models fit an Elite Exchange framework in which cooperation between the main semipublic businesses and political elites responds to pre-established national interests and proves to be mutually beneficial. The proved military influence over imperial affairs after 1931 supports the literature defending Japanese admiration of Soviet command economy at that time and brings definitive evidence against a singular developmental character intrinsic to the Japanese Empire. Notwithstanding, the permanent exchanges between business and rulers remained intact, deviating from the Stalinist total control over production factors. Moreover, they contributed to create a pattern of intra-regional specialization that has granted high levels of regional trade and welfare in East and Southeast Asia maintained until today.

6 . CONCLUSSIONS.

The Age of Empires (1840-1938) didn't only give East and Southeast Asian countries access to European manufactures but also drove the region to unprecedented scales of intra-regional trade, far superior to those observed during the Age of Commerce (1450-1680). The century studied in this dissertation saw the arrival of European empires and the rise of a local one (Japan) that ultimately led the integration process. Foreign conquest involved institutional development, investments in infrastructure and the creation of commercial networks that complemented the historical ones created by local merchants, bringing a significant reduction in the transaction costs faced by traders.

Among the networks created by foreign invaders, the most emblematic ones were those established during the first half of the nineteenth century by the British, centering on Hong Kong and Singapore that tried to facilitate access to China by the European Powers. This web began to be exploited by Chinese and other local merchants during the second half of the century, which is considered the origin of East and Southeast Asian contemporary integration. During the interwar years, a leafy forest of regional commercial exchanges sprouted thanks to the decisive influence of the Japanese Empire. Contrary to the opinions of many scholars, Japanese ascendancy over the regional integration process was not based on a peculiar developmental characteristic of its imperial institutions but on the employment of colonial territories as a source of raw materials and, most importantly, an outlet for its most sophisticated industrial exports. In fact, the process of industrialization experienced by the Japanese Empire during the interwar years, which was supported by business-State cooperation, ignited a process of regional specialization that has continued to evolve ever since, granting high levels of intra-regional trade inside East and Southeast Asia.

In that sense, the apparent inseparability of Japanese industrialization and its imperial expansion represents the heart of East and Southeast Asian regional integration during early-20th century. The use of conquest as a substitute for productivity for consolidating the industrialization process fits classical theories regarding industrial development, according to which backward countries tend to have more interventionist governments during the course of industrial expansion. A decisive element of those theories is the extraordinary emphasis that backward countries placed on the most technologically advanced sectors, a fact that is also observed in the industrial plans of the Japanese Empire. In sum, the late-comer condition of Japan and its needs to converge with the most advanced

nations instigated the employment of imperial mechanisms for sustaining the production of the most sophisticated manufactures. Moreover, the condition of late-comer is also applicable to Japan as an Imperial Power, which at first tried to imitate the policies of traditional Empires like the British. Afterwards, both industrial and imperial strategies aligned with that promulgated by analogous countries like Germany or the Soviet Union.

All in all, the present thesis pivots around two main themes. The first one is the disentanglement of commercial relationships in East and Southeast Asia at their historical roots. In that aspect, this work bequeaths a new imports database that depicts commercial activity inside East and Southeast Asia in a more reliable way than already existing ones. It consists of almost a hundred years of imports for 13 countries, disaggregated by country partner. This new dataset has permitted us to illustrate the superior degree of intra-regional trade enjoyed by East and Southeast Asia from the second half of the 19th century in comparison with other regions like Western Europe or Latin America. These results add a historical perspective to the literature of open regionalism in the periphery by demonstrating that an outlying region was already commercially integrated long before the second globalization. Moreover, we believe that they are applicable to a diverse set of studies regarding East and Southeast Asia's incorporation into the global economy.

Nonetheless, the particularly high levels of regional exchanges found in East and Southeast Asia during the period analyzed in this thesis, deserve to be framed in a narrower literature that helps us to understand their historical meaning and present implications. In this regard, the conceptualization of the case studies as Natural Trading Partners would make it highly advisable to continue the present integration process. For this purpose, we have surveyed the literature on this topic to establish a set of conditions that should be complied to deserve this label. Such categorization will be useful to those who want to add to the debate on special trade relationships between countries before the establishment of Free Trade Areas. The suitability of these criteria is tested by demonstrating that East and Southeast Asian countries met such criteria by the eve of the Second World War. Moreover, we also demonstrate that historical determinants were more relevant than economic factors in the establishment of such special trade relationships, showing that history should be incorporated into the Natural Trading Partners literature as a decisive factor.

The second axis sustaining the arguments of this thesis is the recognition of the mechanisms linking Japanese imperial expansion and its economic development, its legacy

in East and Southeast Asian regional integration apart. This is done by an empirical demonstration of the employment of power mechanisms by Japan to expand industrial exports during a period of stagnant productivity. In fact, the use of colonial markets as an outlet for Japan's least productive manufactures exemplifies the use of trade in the shadow of power by a backward country in its process of self-development. These conclusions are reached thanks to the reconstruction of Japanese intensive and extensive export margins between 1912 and 1938, which complements previous works that calculated them between 1880-1910 (Meissner & Tang, 2018) and permits other researchers to expand their research on the Japanese export expansion during its whole industrialization process.

Many historians believe that the above-mentioned practices and their positive implications on the consolidation of regional trade networks denote a peculiar developmental character attached to Japanese Imperial institutions. Nevertheless, the present thesis argues that the conquest of colonial markets was also employed to complete the industrialization processes of other late-comers and that imperial policies responded to the interests of different Japanese elites. At first they were inspired by traditional empires like the British and attended to the dictates of big business, while during the 1930s they rode the wave of Total War models promoted by Nazi Germany or the Soviet Union, satisfying military desires. Both kinds of elites established mutually beneficial relationships with imperial authorities, which enter the category of Elite Exchange, a concept applied in the present work to colonization frameworks in contrast with models of Business/State Capture that were created to depict those interactions in National systems.

Certainly, all those contributions are remarkable, but the present research faces some limitations, the resolution of which will be the subject of future research. First of all, our understanding of commercial upgrades in peripheral regions is based on research of the historical singularities of East and Southeast Asian regional integration. Nonetheless, this work is worth complementing with research surveying the main characteristics of regional integration of other peripheral regions, like Latin America, during a coeval era as a way of appraising the whole picture. In addition, the regional integration of East and Southeast Asia is studied looking only at import flows, but we are missing the other side of the coin, which is the evolution of regional exports. Moreover, in the future there are other indicators that can be exploited to enlarge our understanding of the regional integration dynamics between the studied territories, an example being the existence of price convergence.

Apart from that, our study of the origins of regional integration of East and Southeast Asia is restricted to a century in which Empires were particularly active, so maybe their observed relevance on the integration process is simply a consequence of timing. For that reason, we should extend our analysis back in time to see if the process of regional integration began before the arrival of the Imperial Powers, which would mean that there were other factors behind the growth of East and Southeast Asian regional integration. This could be done because we have information regarding trade at certain Asian ports during the second half of the 18th century, although one would have to renounce the consistency of political units created in the present thesis. Similarly, the extrapolation of the high levels of intra-regional trade found for East and Southeast Asia before 1938 until nowadays is based on evidence found in the literature, which should nevertheless be empirically demonstrated. As a consequence, future projects will be devoted to better understanding the evolution of regional trade in the analyzed territories across the Second Globalization era and how the tendency towards trade in parts and components has affected commercial exchanges between neighbors.

Finally, one of the principal cornerstones in which this thesis is sustained deals with the appraisal of Japanese Imperial policies and their commercial legacy. The results of this evaluation are portrayed by the observed influence that military targets exercised over business outcomes inside the Japanese Empire during the interwar years. Nevertheless, this conclusion is limited to a certain territory like Manchuria, so in order to complement this analysis we should study exchanges between economic and military elites on the Japanese mainland and how they influenced the process of colonization in territories like Taiwan or Korea during the same period.

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8 . APPENDIX

A . SUBMERSION INSIDE EAST AND SOUTHEAST ASIA HISTORICAL TRADE DETERMINANTS.

A.1. Sources and estimation of independent variables

The following appendix will contain detailed information necessary for computing missing data regarding the independent variables included on chapter 2. The principal source for GDP information has been (Maddison Project, 2014) which collects GDP in 1990 GK Dollars for many countries. However, there are some territories for which Maddison data only covers some benchmarks (for some there is data every ten years, other just cover 1820, 1850, 1870, 1890, 1913 and 1938). In any case we assume a constant annual growth rate of real GDP between every benchmark in order to interpolate the desired figures. In addition, there are some countries, especially in the Middle East, Africa and the Caribbean for which there is no data prior to 1950. In order to fill this gap we have translated back in time 1950 data by assuming Maddison GDP to follow the same trend as constant GDP obtained from (Federico & Tena, 2019). Lastly, for some marginal territories for which there is no constant GDP data we have taken back in time Maddison 1950 GDP by using the growth rate of each territory corresponding exports at constant 1913 prices, obtained from (Federico & Tena, 2019). Data on GDP is divided by total population found in (Maddison, 2014) in order to calculate GDP per capita of importer and partner countries.

The absolute value of differences in GDP per capita is going to approximate differences in demand structure. Finally we measure differences in population density between regional partners by dividing total population by the extension in squared kilometers which is found on the League of Nations. This source includes data in 1913 and 1938 so we can account for changes in the borders during WWI and the Sino-Japanese wars. In fact, the only territories whose extension was modified were China, French Indochina and the Kwantung Leased territories whose frontiers expanded in 1931. This measure represents differences in factor endowments.

Regarding trade costs we start with exchange rate which is constructed by dividing the nominal exchange rate between partner currency and the dollar by the one between local currency and the dollar (local currency per dollar), data which mainly

come from (Federico & Tena, 2019). Some estimations and assumptions have been performed for territories for which our main source doesn't contain information: Taiwan, Korea and Kwangtung had the Yen during the period for which we have imports data, so we assume the same exchange rate as Japan. Reference exchange rates for the rest of countries are obtained from (Mood, 1930). Those data are extrapolated back assuming the same evolution as India (for the case of British Malaysia and Singapore since both were British Colonies and the Rupee was a co official currency) and China (for the Hong Kong dollar which was silver based in the same way as the Haikwan Tael).

Information about average levels of tariff protection are obtained from (Blatman et al., 2003) and calculated by dividing import duties by total imports. Information for marginal territories like certain British Colonies outside Asia comes from Statistical Abstract of the British Colonies, the one of Korea comes from (Mitchell, 2003) and average levels of tariff protection for French Indochine come from Annuarie Statistique de la France (1922-1938).

For the case of total railway kilometers, information has been basically obtained from (Mitchell, 2003). In addition, data from British colonies for which there is no information in Mitchell have been complemented with information found on the Statistical Abstract of British Colonies, which is obtained in miles and transformed to kilometers using their equivalence. For periods in which there is no information we have assumed constant annual growth rates. Finally, data from Manchuria railway is obtained from the League of Nations annual yearbook and from the Manchuria statistical yearbook. Kwantung railways are assumed to be equal to the total length of the South Manchurian railway obtained from the same sources as Manchuria. Finally, Macao didn't construct railways until the 21st century.

The evolution of freight indices for several routes is used as a measure for improvements on maritime transportation. They are obtained from (Isserlis, 1938) which is complemented with data on (Federico & Tena, 2019) when necessary. We assume territories inside a route to share the same index (1913=100). The chosen routes cover the whole region: East Asia-East Asia, East Asia-Southeast Asia, East Asia-South Asia, Southeast Asia-Southeast Asia, Southeast Asia-South Asia, and South Asia-South Asia. Section B.1 on this appendix provides further details regarding the construction of freights variable disaggregated at product level.

Another relevant historical variable employed on this paper is the number of ethnic Chinese living on a certain territory as a proxy for Chinese merchant networks. We assume that this variable is problematic because the definition of Chinese population vary from source to source, but it is relatively stable and works well for approximating the influence of Chinese immigrants on regional commercial trade in East and Southeast Asia. It doesn't reflect the provincial origin Chinese migrants so we can't control for the different dialects employed. In any case the variable works well as an overall measure of Chinese networks and the definition of ethnic Chinese is relatively stable on time.

Information about Chinese migration on Southeast Asian countries for benchmark years comes from (Purcell, 1966) and is based on census data and from estimates coming from secondary sources. The number of Chinese migrants living in India and Myanmar is obtained from The India Census (1891-1911) and (Pan, 2014).[71] Benchmarks for the Chinese in Taiwan are obtained from (Barclay, 2015), while for data about the Chinese in Korea in 1922 we have (Chen, 1923). In addition, information for Chinese migrants in Japan is obtained from various sources like (Kondo, 2002; Wu, 1974; Unger, 1944). Chinese migrants in Ceylon were quite small in 1963 and we assume them to evolve at the same rate as Chinese migrant stock in India. Finally, we assume a 99,5% of the Chinese population is ethnic Chinese as it is reflected from Chen, (1948)[72]. The Chinese population in Hong Kong is obtained from (Denis et al., 2012) and from (Chen, 1923) and for Macao we assume the same percentage of Chinese population as the one living in Hong Kong. Once again we assume constant annual growth rates for interpolating data between censuses.

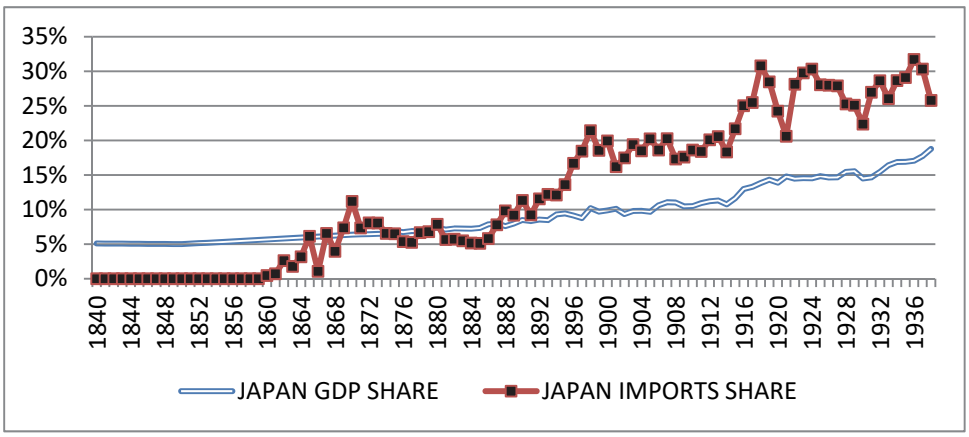
A.2 Discussion

The following section is intended to extend the discussion about the influence that many different historical events could have on the explanation of the special trading relationships enjoyed by East and Southeast Asia countries before 1938 which have been presented on chapter 2. First of all, we will discuss about the influence of Japanese industrialization and economic development. Then, we are going to demonstrate that

[71] Myanmar data is equal to India one multiplied by a percentage found on Purcell.
[72] This figure is considered a lower bound on ethnic Chinese population in China, since in this year the percentage of foreign migrants on China would be higher than in the previous decades in which China was involved in constant wars.

Silver devaluation experienced in the late 19th century facilitated regional trade in East and Southeast Asia, but it can't be considered a decisive integration element since it didn't generate diversion away from Gold Standard countries

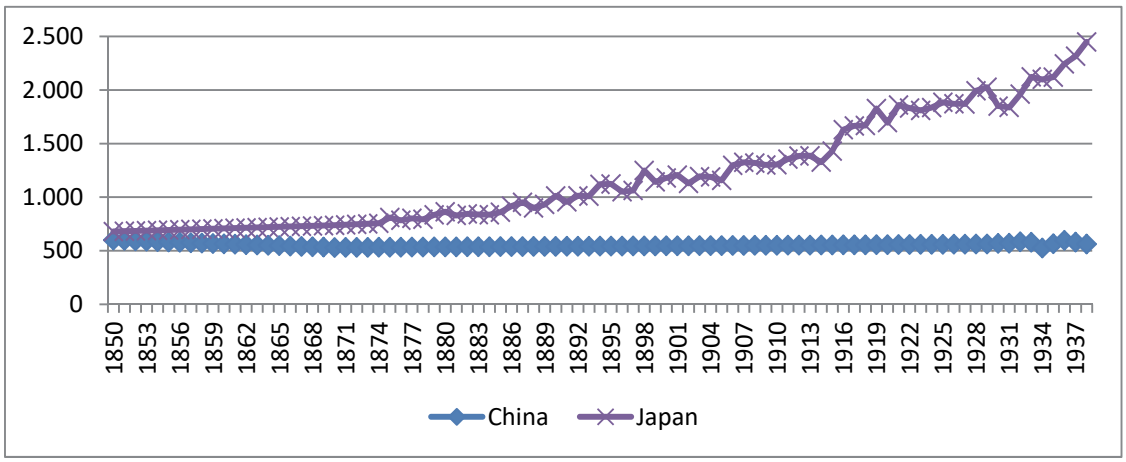
Figure A.1: Japan GDP and imports share over region.



Source: Maddison (2013) and Federico & Tena (2018)

Japan at first had low influence over regional trade because it wasn't economically powerful, its GDP being just around 5% of the region. By the time of the wars against China and Russia Japanese economic capacity incremented reaching a 10% of the region. This permitted the imports explosion of WWI and 1930s after which Japanese economic power increased reaching 15% and 20% over total region's GDP respectively.

Figure A.2: GDP per Capita evolution in Japan and China in 1990 GK Dollars (1850-1938).



Source: Maddison (2013)

Not just Japanese total GDP but also imports or population at the time of ports opening were also small in comparison with China which was the most influential

country in the region. Furthermore, Japan also presented similar GDP per capita levels to China and other poor countries at that time. Nevertheless, by the time of the two wars with China and Russia Japanese GDP per capita already doubled Chinese one and was three times bigger by the years before WWI showing that Japan already had economic potential to become the region's commercial leader. This potential was based on labor abundance as depicted on table A.1 which shows that it was the country presenting bigger population density by the time Perry arrived (1850s). Nonetheless, they only seized this advantage after the institutional reforms carried by the Meiji regime which brought Japan a superior provision of public goods, better structured economic incentives and more aligned interest groups in comparison to China (Ma, 2004).

Table A.1: Population density on major East and Southeast Asia territories (1860-1938)

YEAR	China	India	Indonesia	Japan	Philippines	Thailand	Malaysia	Sri Lanka	French Indochina
1860	34.03	52.32	13.57	85.56	14.35	10.61	4.79	37.66	17.65
1870	32.31	54.20	17.23	88.76	16.99	11.15	5.88	42.21	19.16
1880	33.21	55.10	19.05	94.86	19.22	11.98	8.28	45.77	21.79
1890	34.30	59.90	21.33	103.29	21.73	12.88	11.65	50.65	24.79
1900	36.10	60.95	23.74	113.67	24.58	14.13	16.41	59.27	28.23
1910	38.18	64.72	26.33	127.62	29.73	16.03	21.27	70.73	32.18
1920	42.60	65.47	28.94	143.86	35.99	18.92	26.07	79.55	35.67
1930	44.13	72.07	32.53	165.47	44.28	23.92	32.45	86.47	38.12
1938	46.23	80.57	37.62	185.26	53.47	28.92	38.29	91.59	38.25

Source: Maddison (2014)

All in all, it seems that the little influence exercised by the Japanese Empire on regional trade during the 19th century was related with its small economic size. In addition, its income per capita was average, something that didn't permit it to overcome its small size. Nevertheless, the country had strong potential as it enjoyed huge population density and this advantage was subsequently exploited after winning wars against China and Russia in order to raise its commercial influence in East and Southeast Asia. Lastly, WWI and the Manchuria incident consolidated the Japanese Empire and its influence all over the region.

Regarding the influence of monetary regimes, it is pointed by historiography that in 1871 Silver started to lose much of its value in comparison with Gold**.** This fact forced many countries to leave Silver and adopt the Gold Standard consequently affecting trade patterns all over the world, including East and Southeast Asia. In that region many countries kept Silver currencies between the 1870s and early 1900s and this could have generated trade diversion with Western countries that were massively adopting the Gold Standard and a parallel trade creation with regional partners. In that sense, this phenomenon could also be part of the historical events that permitted East and Southeast Asian countries to become Natural Trading Partners. That's why this section will analyze the gradual change from Bimetallic or Silver Standards to one based on Gold and how it affected regional and international trade in East and Southeast Asia.

Table A.2 shows the different monetary systems prevailing in different territories in the world prior to silver depreciation. As we can see, in 1868 all countries in our region were under a Silver or bimetallic standard as most countries in the world, being the United Kingdom the most remarkable exception. Some scholars argue that the decision of whether to adopt a Gold or Silver standard depended on income as richer countries opted for the Gold Standard and poorer ones by the Silver. Nevertheless, (Eichengreen et al., 2005) does not follow this line and suggest that countries tended to adopt the legal tender employed by their main commercial partners. He also argues that before 1873 there was a stable equilibrium between Gold and Silver exchange rate which was broken during that decade, especially after the abandonment of France and the Latin Union from the bimetallic system.

The greater involvement of Great Britain on international trade until becoming the world's commercial leader made more comfortable to adopt the Gold Standard in order to avoid transaction costs related with the exchange of Silver by Gold. This phenomenon attracted many countries to change to the Gold Standard and as the number of Gold countries increased the system became more attractive. As a consequence, the price of Silver decreased enormously during the 1870s and by 1908 most countries were inside the Gold Standard. East and Southeast Asia was not an exception since only China continued under a Silver standard. Nevertheless, the process was not sudden but the transition to a Gold Standard lasted for more than 20 years in which Asian currencies were at a disadvantage with Western ones regarding imports.

The long path to the Gold Standard and Chinese currency exceptionality could have diverted trade away from Gold Standard countries in favor of regional Silver or bimetallic partners.

First of all, it is necessary to explain the path followed by East and Southeast Asian countries towards the Gold Standard adoption. During the 1870s and 1880s they suffered from the Silver depreciation vis a vis Gold since most of them had imperial ties with Western countries that were adopting the Gold Standard. Consequently, on the 1890s they started to limit the coinage of Silver and moved to a Gold Standard exchange system that differed from the traditional Gold Standard.[73]

The process of adjustment to the new system affected both regional and international trade in East and Southeast Asia. As (Mitchener & Voth, 2011) explain, intra- Asian trade grew much faster than trade with the rest of the world after 1880 partly as a consequence of Silver depreciation that made more attractive to trade with other Silver countries. Thereafter once Asian countries adopted the Gold Standard, intra-Asian trade declined its relative importance as imports from Western countries resumed. This phenomenon could be behind the leap forward experienced by regional share between 1885 and 1895 and its stagnation from then to the First World War appreciated on Figure 3.2 in the main body of the thesis. On the same vein, Western share in East and Southeast Asian imports sharply decreased during 1885-1895 and slightly recovered after Asian territories adopted Gold, although their shares were never close to the ones showed before Silver Depreciation.

[73] Philippines adopted the Gold Standard after US military occupation in 1898, India in 1899, Ceylon in 1901, Korea in 1904. Japan was on Silver since 1868 and authorized a Bimetallic system in 1871. Then it followed a period of inconvertibility due to the wars and rebellions until 1886. Finally, the victory against China in 1895 and the huge amount of Sterling Pounds received as indemnity forced them to adopt the Gold Standard in 1897.

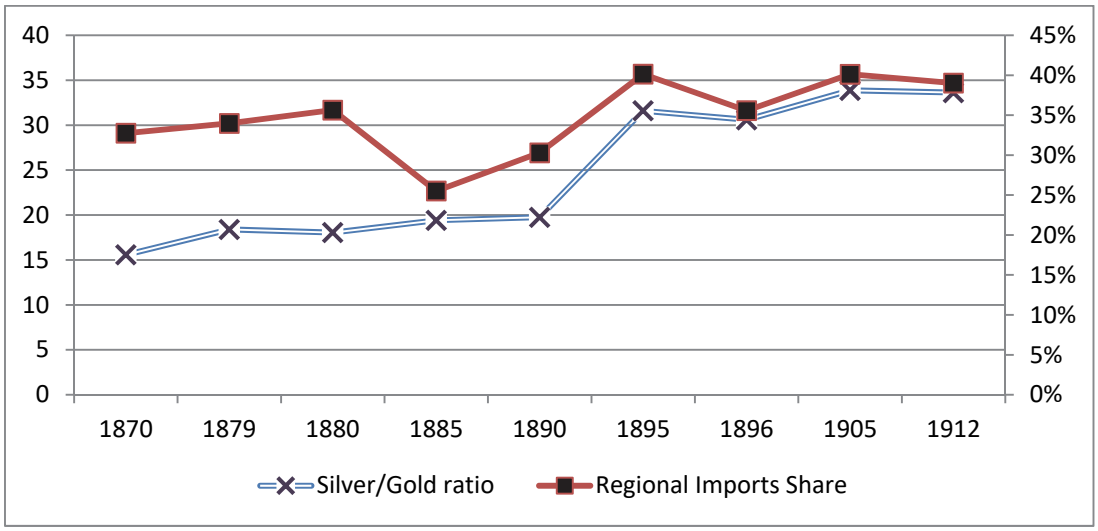
Table A.2: Monetary Systems in the World 1868 and 1908.

Country	Standard	Convertibility
Europe:		
United Kingdom	Gold	Yes
France	Bimetallic	Yes
Belgium	Bimetallic	Yes
Switzerland	Bimetallic	Yes
Italy	Bimetallic	No
German States		
North, South and Hanse Towns	Silver	Yes
Bremen	Gold	Yes
Netherlands	Silver	Yes
Denmark	Silver	Yes
Norway	Silver	Yes
Sweden	Silver	Yes
Austria	Silver	No
Russia	Bimetallic	No
Greece	Bimetallic	No
Spain	Bimetallic	No
Portugal	Gold	Yes
Roumania	Bimetallic	No
North America:		
United States	Bimetallic	No
Canada	Gold	Yes
Central America:		
Mexico	Silver	No
Nicaragua	Bimetallic	Yes
Guatemala	Bimetallic	no date of issue
Honduras	no specific system	no date of issue
Salvador	no specific system	no date of issue
Costa Rica	Bimetallic	Yes
South America:		
Peru	Bimetallic	No
Chile	Gold	Yes
Brazil	Gold	No
Venezuela	Bimetallic	No
Argentina	Bimetallic	No
Asia and Pacific:		
India	Silver	Yes
China	Silver	Yes
Indonesia	Silver	Yes
Japan	Silver	No
Siam	Silver	no date of issue
Phillippines	Bimetallic	no date of issue
Australia	Gold	Yes
Middle East:		
Ottoman Empire	Gold	No
Egypt	Gold	Yes
Persia	Bimetallic	No

Country	Standard	Convertibility
Europe:		
United Kingdom	Gold	Yes
France	Gold	Yes
Belgium	Gold	Yes
Switzerland	Gold	Yes
Italy	Gold	No, but state currency
Germany	Gold	Yes
Netherlands	Gold	Yes
Denmark	Gold	Yes
Norway	Gold	Yes
Sweden	Gold	Yes
Austria	Gold	No, but state currency
Russia	Gold	Yes
Greece	Gold	No, but [illegible]
Spain	Gold (no silver exchange)	No
Portugal	Gold	No
Roumania	Gold	Yes
North America:		
United States	Gold	Yes
Canada	Gold	Yes
Central America:		
Mexico	Gold	Yes
Nicaragua	Gold Exchange Standard	No
Guatemala	Silver (bullion movements limited)	No
Honduras	Silver	Yes
Salvador	Silver	Yes
Costa Rica	Gold	Yes
South America:		
Peru	Gold	No
Chile	Gold	No
Brazil	Gold	No
Venezuela	Gold	No
Argentina	Gold	Yes
Asia and Pacific:		
India	Gold Exchange Standard	Yes
China	Silver	Yes
Indonesia	Gold Exchange Standard	Yes
Japan	Gold:Gold Exchange Standard	Yes
Siam	Gold Exchange Standard	Yes
Phillippines	Gold Exchange Standard	Yes
Australia	Gold	Yes
Middle East:		
Ottoman Empire	Gold Exchange Standard	Yes
Egypt	Gold	Yes
Persia	Bimetallic/Silver	Yes

Source: Eichengreen et al (2005).

Figure A.3: The price of Silver (left) and regional imports share (right) (1885-1912).



Sources: For regional share see text. For Silver/ Gold ratio see Officer and Williamson (2019)

The relationship between Silver depreciation and the raise of relevance of regional imports during the Asian transition to the Gold Standard is appreciable on figure A.3 in this appendix, in which Silver devaluations are matched by raises in regional share until 1912, the year in which the transition was completed and only China remained in Silver. Summing up, the analyzed literature and a partial analysis of our data present the possibility that the Silver depreciation and the long transition to the Gold Standard of East and Southeast Asian countries could be another historical event behind the great regional integration levels presented by those countries before the Second World War, specifically between 1880 and 1913.

In order to check this we have created a dummy variable taking value 1 when a country entered the Gold Standard and 0 otherwise. This variable is dynamic in the sense that its value changes whenever a territory enters or leaves the Gold Standard system. In order to determine the years of system entrance or abandonment we have surveyed a bunch of researches like (Eichengreen & de Macedo, 2005; Lawrence and Williamson, 2019; Mitchener & Voth, 2011; Wandschneider 2008; Basino & Nakagwa 1990).

This variable is going to reflect trade creation or diversion between Gold Standard adopters and countries inside our region, which mostly continued on Silver until the late 19th and early 20th century. The main focus will be on the period of greatest Silver depreciation which was 1880-1913. This value loss experienced by

Silver would have contributed to a reduction of imports coming from Gold Standard countries compensated by higher regional imports.

What we can appreciate is that in line with the findings in chapter 2, the period of Silver depreciation and transition to Gold Standard coincided with a reinforcement of regional integration since the coefficient for this variable increases. However, we cannot appreciate trade diversion regarding Gold Standard countries because this variable is still positive and significant during 1880-1913 (although the coefficient is reduced) whereas for reflecting trade diversion it should be negative. In other words, this regression suggests that Silver depreciation and the non-adoption of the Gold Standard for most of this period is not a decisive element behind this regionalization because we cannot appreciate trade diversion away from Gold Standard adopters, although it might temporarily helped on the integration process as reflected by the behavior of exchange rate variable on the thesis core.

Table A.3: Total imports determinants in East and Southeast Asian countries (1840-1938) accounting for Gold Standard adoption.

VARIABLES	(1) Whole Sample	(2) 1840-1863 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1913-1938 Sample
GDP	0.705***	0.754***	0.314***	0.564***	1.022***
	(0.0388)	(0.139)	(0.0767)	(0.0349)	(0.0598)
DISTANCE	-0.700***	-0.887***	-0.760***	-0.719***	-0.621***
	(0.0304)	(0.147)	(0.0418)	(0.0363)	(0.0482)
TARIFFS	-0.227***	-0.887*	-0.701	0.140	-0.344**
	(0.0754)	(0.532)	(0.480)	(0.0883)	(0.144)
REGIONAL	1.452***	0.830***	0.850***	1.213***	2.021***
	(0.0741)	(0.243)	(0.188)	(0.105)	(0.0701)
GOLDSTANDARD	0.953***	1.623***	1.738***	0.779***	0.998***
	(0.0743)	(0.181)	(0.126)	(0.0805)	(0.113)
COLONY	3.558***	4.545***	4.145***	3.436***	3.168***
	(0.0602)	(0.199)	(0.220)	(0.0551)	(0.0802)
EUROPE	0.586***	0.196	0.620***	0.818***	0.452***
	(0.0745)	(0.175)	(0.133)	(0.0757)	(0.128)
SHAREDMETROPOLI	0.384***	0.137	0.508***	0.139**	0.807***
	(0.0507)	(0.130)	(0.148)	(0.0586)	(0.0722)
Constant	7.085***	10.47***	5.480***	8.881***	5.414***
	(0.405)	(2.071)	(1.126)	(0.392)	(0.512)
Observations	16,360	833	1,348	6,863	7,315
Number of YEAR	99	24	16	34	25

Robust standard errors in parentheses

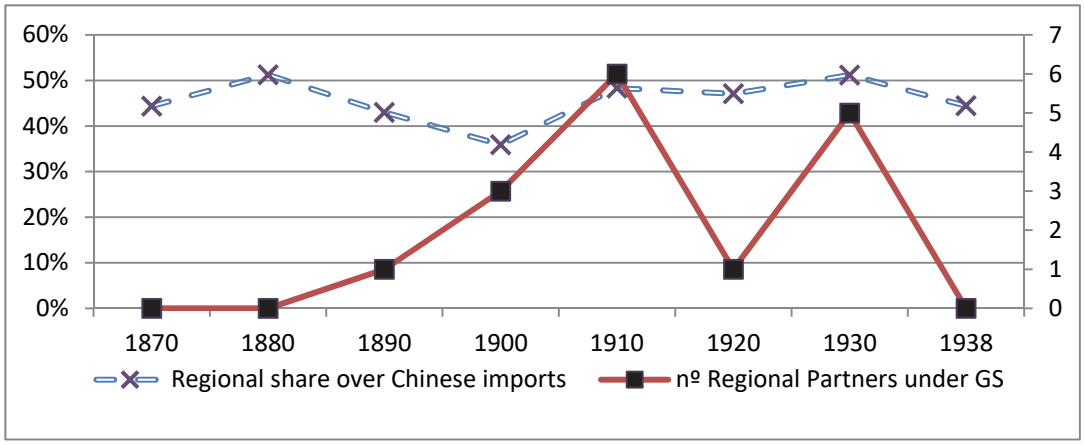
**** p<0.01, ** p<0.05, * p<0.1*

On a similar regard, one should realize the special position held by China which by 1908 was the only country in the region maintaining a Silver based currency.

This permitted the country to have a much more flexible exchange rate with Gold Standard countries, although its general trade suffered a lot from strong fluctuations presented by Silver price during the interwar years. This phenomenon was quite common on most countries during the turbulent interwar years in which almost every country let its currency to freely float during one moment or another, but Chinese commercial dependence on the price of a single commodity (Silver) during our whole period of study made its case exceptional (Remer, 1926; Burdekin, 2008).

This exceptionality could isolate China on international markets and thus undermining the regional integration process ongoing in East and Southeast Asia. Nevertheless, we don't have any reference that this happened since by 1910 when almost every country in the region adopted the Gold Standard, China was equally isolated from its regional and Western partners. Furthermore, results in table A.3 showed that Silver depreciation didn't divert trade away from Gold Standard countries, so the monetary system adopted was not a crucial factor determining regional trade composition at that time. This fact can also be appreciated on Figure A.4 in which we can see that, although early Asian adoptions of Gold Standard reduced regional share among Chinese imports, during the decade in which more Asian countries changed the system (1900-1910) Chinese regional imports share grew substantially (from 36% to 48%). In addition, the decade in which most Asian countries resumed the Gold Standard also coincided with an expansion on the regional share of China imports.

Figure A.4: Number of East and Southeast Asia countries under the Gold Standard (right) and Regional share on Chinese imports (left) (1870-1938).



Sources: See text.

As a summary, we can conclude that the Silver depreciation and the slow transition towards a new monetary system that took place on the last quarter of the 19th

century were not decisive factors explaining regionalization in East and Southeast Asia before WWII. As pointed by the literature it could have contributed to increasing regional trade volumes during the years in which most Asia was under Silver and the West was in Gold as it is appreciated on chapter 2 with the behavior of exchange rate variable. However we don't appreciate any significant trade diversion away from Western Gold Standard countries and in favor of regional partners, which would have demonstrated a true regional bloc creation. For that reason the core of the thesis controls for exchange rates between currencies at the different periods as an explanatory variable for regional trade but we don't consider them to be overriding determinants.

A.3. Counterfactual exercise and Econometric concerns

One of the principal contributions of this thesis to the literature of Natural Trading Partners is the empirical demonstration of the significant influence that historical events exercised in shaping special trade relationships between territories. In that sense, regressions performed have shown much bigger coefficients for historical variables like colonial institutions and networks than for economic variables traditionally explaining why two countries could be considered Natural Trading Partners. For example we find that a 1% raise on differences in demand structure lead to an increment on regional imports of 0.156%, whereas regional imports associated to members of the British and the Japanese Empires were respectively 235% and 1358% higher than those to non-members ($e^{1.208}$-1= 2.35 and $e^{2.680}$-1=13.58). The size of the influence of colonial and transit networks gets even bigger at certain time periods, which might indicate that those historical phenomenom were much more decisive than economic characteristics in the formation of a natural trade bloc in East and Southeast Asia.

Nevertheless, we must be careful with this assertion because we are comparing variables of different nature and characteristics because historical variables like transit, British and Japanese imperial networks are proxied using Dummies and economic variables like differences in demand structure or factor endowments and trade costs are continuous variables. For that reason, in order to measure the size of the effects associated to these two kinds of variables on a comparable way we are going to make a counterfactual exercise.

The objective of this exercise is to measure the impact that direct colonial networks (exchanges between countries sharing a colonizer) and complementarities in

demand had on regional imports. We are trying to see how large regional imports would have been in case no imperial relations at all were established on the region on the one hand and in case demand structures were very similar on the other. That's why we are going to construct two scenarios choosing as a reference total regional imports on 1938 which is the last year of our database: The first one will estimate the total amount of regional imports in 1938 if the growth path followed by every country from the very first year in our sample was the same as average growth of imports coming from countries with which it had no imperial relationship at all. On the second scenario we estimate how large would regional imports be in case they have grown in every country at the same rhythm as imports coming from the territories presenting the most similar demand structures. In order to do so we have decided arbitrarily that the most similar partners are those with which absolute difference in GDP per capita in 1938 doesn't exceed total GDP per capita on the importer country. In other words, we eliminate those partners whose GDP per capita is at least twice the importer's which are considered in our paper to be the complementariness These approximations are not probably the most exact but permit us to check how much lower would regional imports be in case any country would have hold imperial relationships and in case there are no complementarities in demand.

Our results show that in case no imperial networks had ever existed, regional imports in East and Southeast Asia would have been 79% lower than they were in reality. On the other hand they would have been 71% lower if there were no significant demand complementarities inside the region. All in all, what it is found is that the impact of a historical event like imperial networks was slightly higher than the one of economic characteristics like demand complementarities.

The reason for choosing this approach in which the counterfactual evolution of imports is based on a set of partners is to avoid fluctuations related with the election of only one partner country as a reference. Nonetheless, we have practiced another exercise in which we assume on the one hand that each country's total imports follow the same growth rate as imports from an independent (and not too big) country like Thailand. On the other side we assume that individual total imports evolve at the same path as imports from the country presenting the lowest differences on demand structure. This situation although much more reasonable from an empirical point of view has the statistical problem that imports from the reference country might begin from very low

levels, so growth rates used as reference might get too large. Anyway, this statistical concern might affect both scenarios equally so the main conclusions of this exercise would still be valid. If we practice this approach we find that regional imports would be 29% lower had no empires ever existed in the region and 9% lower in case demand structures were almost the same between different territories in East and Southeast Asia.

All in all, this section aims at measuring the impact that historical and economic determinants had on regional integration using comparable standards. What we find in both cases is that the impact of a historical event like the creation of imperial networks was bigger than the one of an economic determinant like complementarities in demand. In other words, regional imports would be much lower if the region wasn't colonized than if no demand complementarities had ever existed.

On the other hand**,** the results obtained on the main article are subject to determined econometric caveats. All of them have been shortly addressed inside the thesis, but we believe they deserve a more detailed and extensive explanation. The first possible problem related with our research is the appearance of autocorrelation related with the construction of panel data, meaning that information of one period could be correlated with the one found on previous periods. In order to test that, we have performed the Wooldridge test for autocorrelation in Stata, finding that equation 3.1 (the one dealing with total imports determinants) presents signs of serial correlation, while equation 3.2 (the regional one) doesn't.

Table A.4: Wooldridge test for autocorrelation Total Imports

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      11) =      6.952
           Prob > F =      0.0231
```

Table A.5: Wooldridge test for autocorrelation Regional imports.

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      11) =      2.469
           Prob > F =      0.1444
```

In order to solve this problem, the literature proposes to estimate the equation assuming there is first order autocorrelation using xtregar command in Stata (Cazenave-Lacroutza & Lina, 2019). Results of this estimation method are obtained on table A.6 and we can see that this new estimation procedure brings a much higher value for the

regional dummy, reinforcing our argument that East and Southeast Asia countries met the criteria of trading more intensively with each other than what gravity forces suggested. The analysis of these results should be done carefully because this estimation method gets rid of most observations, but still we believe it reinforces our main argument after controlling for autocorrelation.

Table A.6: Determinants total imports under First Order Autocorrelation.

VARIABLES	(1) IMP
GDP	0.308***
	(0.101)
DISTANCE	-0.376**
	(0.175)
TARIFFS	-0.224
	(0.281)
REGIONAL	2.648***
	(0.415)
COLONY	1.728***
	(0.350)
EUROPE	2.539***
	(0.303)
SHAREDMETROPOLI	0.528
	(0.358)
Constant	7.982***
	(2.274)
Observations	767
R-squared	
Number of compid	14

The second and third econometric issues behind the models constructed on the chapter 2 could be more problematic. First of all, the literature has long debated about the necessity of controlling multilateral resistance to trade on Gravity Models like the one presented on this paper. The idea underlying this problem is that barriers that two countries have to face when trading with each other go beyond the ones bilaterally settled by them but barriers imposed by the rest of the world should also be taken into account (Behrens et al., 2012). Many authors defend that this could be controlled by adding exporter and importer fixed effects (Redding & Venables, 2004) as we do on our main regressions, while others advocate for the use of time variant fixed effects (Yang & Martínez-Zarzoso, 2014) which is done by us on the robustness checks corresponding to chapter 2 (table 3.4, column 1). Nevertheless, there is still a set of authors defending that the proper way for addressing this problem is controlling structural resistance (Anderson & Van Wincoop, 2003) and in order to do that we estimate the model by Poisson Pseudo-Maximum Likelihood (PPML) but incorporating exporter and importer

plus time fixed effects (Fally, 2015). Results appear on the second column of table 3.4 in the thesis, although they only apply to the regional regression. For that reason the following table will show the results of the regression estimating the determinants of total imports after properly controlling for multilateral resistance. What we can see basically is that every variable behaves in the same way as before and results confirm that regional partners traded more with each other than what GDP and trade costs suggest.

Table A.7: Determinants of total imports controlling structural multilateral resistance to trade

VARIABLES	(1) PPML Fixed Effects
GDP	1.059***
	(0.0770)
DISTANCE	-0.222***
	(0.0230)
TARIFFS	-0.195***
	(0.0508)
REGIONAL	0.835***
	(0.0718)
COLONY	2.238***
	(0.0587)
EUROPE	0.401***
	(0.0611)
SHAREDMETROPOLI	-0.0214
Constant	1.381
	(1.185)
Observations	16,361
R-squared	0.412

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

A final econometric concern we should address is the treatment of zero flows. As it has been mentioned on the main article, we don't have certainty about the true meaning of zero flows since they can represent absence of trade or they can be simply accounted on the "other partners" category. For that reason, we decided not to include them on the original estimation, although the employment of PPML on the robustness checks section permits us to use these zeros and what we find is that they represent more than half total flows, leading to a possible excess zeros. In order to solve this, the robustness checks section estimates the regional equation using Zero inflated Poisson method (Martin & Pham, 2015). This is something that we've been unable to do on the total trade equation since countries present hundreds of partners across the century and it wasn't feasible to include all of them on a panel. The most important thing is

nevertheless that the main conclusions obtained on the original estimation are maintained after adjusting for excess zeroes as can be seen on table 3.4 (column 3) in the core of the thesis.

Apart from the commented econometric issues, the Gravity Model constructed on the main article is also subject to methodological concerns, mainly related with variable selection. There are many authors that argue that population should be incorporated to the analysis of trade flows as another approximation of market size (Carrere, 2006). In the case of East and Southeast Asian regional integration it might be a good complement for GDP since it will better represent the growing demand for rice on the late 19th century.

Nevertheless, what we've found is that in this specific example, population and GDP don't act as complements but are substitutes since the inclusion of both of them brings a negative coefficient for population variable, something that makes little sense. If we substitute total GDP by population as a proxy for market size we find that population behaves in the same way as GDP. Anyway, the most important thing is that the inclusion of population either as a substitute or as a complement of GDP doesn't undermine the significance of regional trade as can be appreciated on tables A.8 and A.9. In the end, these results are confirming our hypothesis that East and Southeast Asia countries traded with each other more than what gravity suggested, no matter which variables you add as a proxy for market size, although the incorporation of market size to the analysis shows that intra-regional trade was relevant even during the period of network construction

Table A.8: Determinants of total imports including population as a substitute of GDP 1840-1938 (Transit trade included).

VARIABLES	(1) Whole Sample	(2) 1840-1864 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1914-1938 Sample
POPULATION	0.611***	0.438***	0.340***	0.492***	0.872***
	(0.0297)	(0.101)	(0.0654)	(0.0207)	(0.0507)
DISTANCE	-0.458***	-0.727***	-0.572***	-0.443***	-0.339***
	(0.0331)	(0.124)	(0.0381)	(0.0408)	(0.0538)
TARIFFS	-0.351***	-0.579	-0.764*	0.201**	-0.679***
	(0.108)	(0.491)	(0.446)	(0.0823)	(0.147)
REGIONAL	1.466***	0.620**	0.614***	1.260***	2.008***
	(0.0813)	(0.276)	(0.199)	(0.128)	(0.0740)
COLONY	3.899***	4.730***	4.131***	3.709***	3.745***
	(0.0459)	(0.171)	(0.138)	(0.0376)	(0.0643)
EUROPE	0.804***	0.166	0.824***	1.006***	0.712***
	(0.0778)	(0.162)	(0.0994)	(0.0771)	(0.138)
SHAREDMETROPOLI	0.403***	0.00225	0.685***	0.204***	0.685***
	(0.0462)	(0.128)	(0.151)	(0.0585)	(0.0750)
Constant	7.828***	12.25***	4.951***	7.272***	5.657***
	(0.437)	(1.621)	(0.834)	(0.416)	(0.519)
Observations	16,358	832	1,348	6,863	7,315
Number of YEAR	99	24	16	34	25

Table A.9: Determinants of Total Imports including population as a complement of GDP 1840-1938 (Transit trade included).

VARIABLES	(1) Whole Sample	(2) 1840-1863 Sample	(3) 1864-1879 Sample	(4) 1880-1913 Sample	(5) 1914-1938 Sample
GDP	2.016***	3.729***	1.198***	2.062***	2.158***
	(0.0731)	(0.413)	(0.269)	(0.110)	(0.0858)
POPULATION	-1.437***	-3.292***	-0.849***	-1.596***	-1.293***
	(0.0687)	(0.400)	(0.250)	(0.0978)	(0.0864)
DISTANCE	-0.792***	-1.127***	-0.702***	-0.835***	-0.724***
	(0.0320)	(0.159)	(0.0575)	(0.0394)	(0.0525)
TARIFFS	-0.197**	-1.125*	-0.683	0.0816	-0.426***
	(0.0796)	(0.587)	(0.458)	(0.0950)	(0.135)
REGIONAL	1.906***	0.573**	0.748***	1.760***	2.525***
	(0.0973)	(0.272)	(0.201)	(0.158)	(0.0840)
COLONY	3.200***	4.849***	3.794***	3.000***	2.727***
	(0.0776)	(0.209)	(0.136)	(0.0708)	(0.0885)
EUROPE	0.524***	-0.739***	0.602***	0.704***	0.433***
	(0.0677)	(0.220)	(0.129)	(0.0806)	(0.118)
SHAREDMETROPOLI	0.443***	-0.276*	0.704***	0.272***	0.778***
	(0.0473)	(0.148)	(0.152)	(0.0562)	(0.0727)
Constant	9.252***	18.93***	5.171***	10.22***	7.179***
	(0.380)	(1.831)	(0.849)	(0.284)	(0.552)
Observations	16,358	832	1,348	6,863	7,315
Number of YEAR	99	24	16	34	25

B . A DEEPER UNDERSTANDING OF JAPANESE TRADE SUPREMACY.

B.1. Sources of Japanese exports and estimation of independent variables

The first point in this section is going to describe the main features of data construction, starting by the description of Japanese exports' database. We have constructed a granular database of the value of bilateral Japanese exports by product for different benchmark years at the same level of disaggregation as those offered by the official Japanese trade statistics. We have digitized information found in different volumes (1912, 1915, 1925, 1929, 1932 and 1938) of the *Annual Return of the Foreign Trade of the Empire of Japan.* Official statistics collected and published annually by the *Japanese Bureau of Customs* include a section that collects Japanese exports to every country, disaggregated by single product. Japan used a quite accurate declared values c.i.f system, for imports and f.o.b valuation for exports, and gold and silver are excluded from trade statistics. Japan followed as far as possible the origin-destination method of crediting trade by countries. However, one faces difficulties in getting information on country of origin and destination for goods moving through Hong Kong and Singapore (Allen & Elly, 1953) As we have evidence that Hong Kong's share of total Chinese imports reduced from around 40% at the turn of the century to less than 20% in the 1920's and less than 5% in the 1930´s, we assume that the inaccuracy of the Japanese direction of trade records due to transit is more limited for the interwar years than for previous periods (see Figure 5 in Keller et al., 2011).[74]

According to our database, Japan moved from exporting 512 different products to 37 different countries in 1912, to exporting 1135 goods to 117 countries in 1938.[75] On one hand, more countries records is related with a more precise record of destination, but also with a more extended geographical diversification of Japanese exports. On the other hand, we suspect that the increment in the number of goods exported is neither related with true changes in the Japanese industrial capacity nor with changes on market characteristics, but simply with a change in the classification rules followed by the official statistics as it will be seen in the following section. In addition,

[74] By instance, Meissner and Tang (2018) do not make any adjustment to overcome Hong Kong and Singapore transit trade problems on Japan geographical trade records assignment before 1910.

[75] The category "Exports to other countries" has been omitted because its inclusion didn't permit us to control for partner country characteristics.

it is important to clarify that we also include the zero values of countries to which Japan exported in a determined period, so zeros are included in this database and in the main regressions.

However, this data source presents a relevant drawback since it doesn't include data in Japanese exports towards its main colonies, Korea and Taiwan (although, thankfully they account for exports towards Kwantung province and Manchuria both before and after being occupied for Japan). In order to solve this relevant inaccuracy of the statistical records, and believing that the study of Japanese export patterns towards its colonies is vital for our research target, we have obtained information in Japanese exports towards Taiwan from the *Returns of the trade of Taiwan for forty years* (1896-1935) and annual *Return of trade of Taiwan* (Formosa) (1936-1942) both published by the Department of Finance of the Government of Taiwan. Such returns also include Taiwanese imports from Japan (or equivalently Japanese exports to Taiwan) at the product level. The quality of this database is acceptable; however the level of disaggregation is not the same as the one of the *Annual Return of the Foreign Trade of the Empire of Japan* as it includes a lower disaggregation by product, a fact which could underestimate the extensive margin for Japanese colonies. This is a problem in our data that remains impossible to fully solve, but we have taken several steps to remedy the problem. First, we take the bilateral trade records of Japan with Taiwan in 1915 as a base year because it is the last year in which the number of goods exported to Taiwan employs the same disaggregation level as the other Japanese bilateral records, and then we assume that every 3 SITC category follows the same tendency as the respective ones of the Kwantung Leased Territories.

For the case of Korea, the *Annual Returns of the Foreign Trade of the Empire of Japan* in their volumes from 1914-1920 include an Appendix with data in Japanese exports to Korea disaggregated at the same product level as Japanese exports to the rest of the countries. For the rest of the period, however there is no alternative available source in English that breaks down Japanese exports to Korea at the product level. This is problematic for our research because Korea was probably the most important colony throughout the period. In order to solve this we have obtained from the Long Term Economic Statistics of Japan (LTES tables J1411__001 to J1411__007) at Hitotsubashi University (http://www.ier.hit-u.ac.jp/English/databases/ltes.html) a collection of Japanese exports to Korea disaggregated in this case at the 5 sector level (which

include: I Agricultural Marine and Forest Products, II Mineral Products, III Manufactured Processed Food, IV Textiles and V Chemical, Metals and Machinery) Sectors I and II correspond to Primary products according to our skill classification, sectors III and IV to our low skilled manufactures and sector V to our high skilled. Finally, in order to obtain the extensive margin of Japanese exports to Korea for 1925-1938 we have used, as in the case of Taiwan, 1915 as a base year of skill disaggregated margins and assumed that the number of goods exported inside each sector follows the same tendency as the one of Kwantung, so as to keep the skill breakdown of total exports to Korea unaltered.

We make a conscious decision on the uncontrolled potential bias introduced by this in our data base, but we believe this is our best option and an acceptable assumption for several reasons: first, because Kwantung is the only stable Japanese colony throughout the period, it is affected by the same political changes as Korea and Taiwan. Kwantung was at first strongly influenced by the railway construction like Korea and the economic structures of those three colonies were similar, being its industrialization after the 1930s resembling the one experienced by Korea; second, because Kwantung is across from Manchuria, the territory receiving the biggest number of Japanese product varieties records, rising from 339 products received in 1912 to 911 in 1938, by employing it as a reference we are computing an upper bound on Korea and Taiwan's extensive margin growth.

Regarding the possible determinants of Japanese exports, we've obtained information on GDP and GDP per capita from the last version of the Maddison project and refers to GDP in 1990 GK dollars or real GDP (Bolt and Van Zanden, 2014). This database does not provide information for every country to which Japan exported during the period 1912-1938, but it includes information for future periods. This information is interpolated back to the interwar years by assuming that they have followed the same rate of change as total exports of the corresponding countries (in constant prices) obtained from (Federico & Tena-Junguito, 2019). This last method is far from perfect because exports didn't grow at the same rhythm as total GDP but is a method generally accepted for computing upper bounds on GDP growth.

Another incorporation to the literature is the estimation of GDP levels and other statistics for Japanese colonies of Kwantung Leased Territories and Manchukuo. Population data has been obtained from (Kang, 1981) and the corresponding GDP is

calculated as the proportion of Japanese GDP equal to the percentage each population represents over the Japanese total (the exercise for Manchuria is the same but using China as a reference because until 1932 it was part of China). The Kwantung GDP is considered to follow the same rate of growth as the Japanese one (since it is a Japanese colony), whereas Manchuria's follows the same tendency as China until 1932.[76] Afterwards, its GDP is assumed to grow at the same rate as Manchurian exports taken from (Federico & Tena-Junguito, 2019).

There still remains a group of territories that are provinces, colonies or autonomous territories belonging to European Empires for which no data is available but which appear as independent entities in Japanese statistics and for that reason are treated as such in the present research. So, we use also marginal data recorded for Africa and the Caribbean polities. We include their GDP proxied as a proportion of its colonizer's GDP, according to total population. Population from those territories is obtained either from the League of Nations or from censuses obtained on the mainland official statistics (like Annuarie Statistique de la France, Spanish INE data, Annuario Statistico Italiano, British Parliamentary papers etc…). This procedure allows us to extend GDP estimations for as many countries as possible in order to get partners' demand by their respective economic size growth (dividing it by population obtained from the League of Nations and Mitchell).

Then productivity is estimated through the division of GDP by the corresponding data on total hours worked found mostly in (Huberman and Mins, 2007) in order to construct GDP per hour worked. Working hours refer to total hours worked per worker (male and females) in productive non-agricultural activities. This first source only includes data of hours worked per employee for 15 advanced countries. Our database is complemented with information on total working hours for 9 peripheral countries in Europe including Russia obtained from (Maddison, 2007; Maddison, 1995). Information on both databases is not annual, so it has been translated to our benchmark years assuming constant annual rates of change.

[76]Kang includes data for 1912 and for the period 1924 to 1941. Population for Manchuria in 1915 has been obtained by multiplying 1912 data by the rate of change of total Chinese population and for the case of Kwantung Leased Territories the same has been done but assuming the same rate of change of Japan's population (as it was a Japanese colony) in order to differentiate development of Japanese colonies from other East Asian territories

This data is likely to refer to a subset of economic activities, excluding agriculture that is a sector with complex seasonal working hours. (Huberman, 2007; Maddison, 1995) would show that the average number of hours per worker decreased substantially during the first third of the twentieth century. We know, according to (Federico, 2005) that the number of hours and part time work in advanced countries reduced the number of working hours in agriculture, probably at a slower rate, but adapting to the general trend of the wide economy in the period. Unfortunately, (Federico, 2005 Table 4.2 p.63) data on agricultural working hours is too scarce and provisional to be used to introduce a different correction for agriculture than for the general data on the wider economy. In order to avoid measurement errors in the construction of the variable we have decided to deduct agrarian output from total Maddison GDP. Agrarian share over National product is found in (Mitchell, 2003) and we subtract the corresponding percentage from Maddison's data in 1990 GK dollars. To estimate non-agrarian GDP per hour worked for those 24 countries and for Japan we multiply hours worked on average by the employment in the non-agrarian sector which is also obtained from (Mitchell, 2003).

Finally, all this information is complemented with data on GDP per hour worked for Taiwan (representative of productivity in Japanese colonies), Indonesia (representing productivity in Japan's future dominions), India (which is the leader among other Asian poor territories outside the Japanese sphere of influence) and bigger South American countries like Argentina and Brazil. We use total hours per worker for those territories in 1950, from (Maddison, 1995), multiplied by non-agrarian employment obtained in (Mitchell, 2003). We interpolate back in time assuming they follow the same trend as total employment (excluding agriculture), following the same source.[77] All in all, GDP per hour worked in non-agrarian sectors is a variable that in this database is offered for Japan and 27 country partners which represent 92% of Japanese exports. In order to capture Japanese productivity improvements relative to partner countries we divide Japanese non agrarian GDP per hour worked by the corresponding partner's one.

We also use relative real wage growth between Japan and its partners as an

[77] India and Indonesia total hours in 1950 are assumed to be equal to the ones that appear under the section "other Asia".

additional variable to capture productivity gaps. The use of this variable generates controversy among scholars, because when there is no perfect competition, as in Japan during the interwar years, real wage differentials may not reflect productivity differentials. The first strategy consists of building a wage index ratio by dividing Japanese real wage growth in relation with the corresponding partner along benchmarks (so an increase of the index means that Japanese wages are rising faster than those of its trade partners). Data for real wages is obtained from (Williamson, 1995) which includes information for 30 countries on the five continents including the Japanese colonies of Korea and Taiwan and future conquests like the Philippine Islands, Indonesia or Siam. Regarding countries with no information, as is the case of GDP per hour, we include a zero value.

The second strategy is based on the assumption that Japanese comparative advantage was not necessarily related with higher wages that might reflect higher quality production, but perhaps sectorial lower unit costs. Following this idea, we estimate an additional productivity measure to capture, as much possible, the differences in the evolution of relative skill sectorial productivity in Japan. We have found data in Japanese manufacturing output in different sectors and their respective employment during the period. We use the machinery sector to capture the evolution of the high skilled sector and the cotton textiles sector for low skilled manufactures. Data is offered in LTES (Long Term Economic Statistics of Japan, tables JPA19__008, JPA19__002 and JPA16__008 respectively) from Hitotsubashi University. We use the employment share of each sector over total hours worked as a proxy of the number of hours worked in every sector. This allows us to construct two productivity differential indices for Japan in high skilled and low skilled manufactures. We use each of them divided by partners' overall productivity. Lastly, information regarding population density as a proxy for the difference between Japan and its commercial partner's factor endowments has been obtained from League of Nations (1927-1945) Statistical Yearbooks data.

The next thing is to study the sources of trade costs. The most common variable employed in the literature on gravity to measure transport costs is distance between countries, but it is time and product invariant. This paper makes an effort to overcome the implications of this limited assumption on the measure of transport costs. A relevant contribution of this paper is the construction of a database of estimated

freight factors (cost of transport per ton/product price per ton) between Japan and each country partner, for every single product exported by Japan for each of our corresponding benchmark years. In our strategy geographical distance between Japanese partners is combined with different freight rate routes and differences in freight factors by composition of products. Freight rates are better proxies for transport costs than simple geographical distance, as they reflect the variations in number, size, tonnage, speed and oil consumption on vessels employed in the different routes or the freight price differentials driving by shipping competition along each route.

In order to do so, we have first delimited the world into three freight regions: Europe (including Africa), America (North and South) and Asia (including Oceania), the latter crucial for the study and subsequently divided into three further regions: the East Asia route, which includes those Asian countries which were closer to Japan and with which it had strong colonial or other political relationships, the Southeast Asia route, including countries conquered by Japan and annexed to the empire during WWII, and the Other Asia and Pacific route, with very distant Asia and Pacific countries with which Japan did not have any economic nor political stake.

Those freights also vary between product sectors since we have a different freight factor for every 3-digit- SITC, making our trade costs variable sensitive to changes in trade composition by trade partners and in consequence by skill level. We are able to compare these results only for the general equation without skills with those obtained using the conventional method of Great Circle Distances (in kilometers) between Capital Cities (Source: own calculations using Latitude and Longitude data from worldatlas.com), and in this case the results are very similar, with coefficients presenting almost the same levels and significance as is shown by Table B.1, the coefficient of Colonies and Future Conquests being even more powerful.

Table B.1: Main Regression Employing Distance Instead Of Freights.

VARIABLES	(1) EXP
GDP	1.351***
	(0.424)
RELPRODUCTIVITY	0.479
	(0.395)
REL WAGES	0.460
	(0.389)
POPDENSITY DIFF	0.544***
	(0.179)
GDPCAP ABSDIFF	1.516***
	(0.453)
DISTANCE	0.157
	(0.280)
EXCHCONTROL	-1.081
	(0.772)
EXCHRATE	-0.468***
	(0.124)
TARIFF	-0.357**
	(0.178)
COLONY	2.858***
	(0.983)
OCCAFTER1938	1.006**
	(0.391)
DIPLOMATS	0.116
	(0.101)
IMPORTS	0.162
	(0.139)
Constant	-9.224
	(5.819)
Observations	674
R-squared	0.636

The procedure for obtaining our freight factor data base is the following one: we have first delimited the world into three freight regions or transport cost routes, assuming a common freight per route which will vary between countries according to their distance with Japan. The main Japanese trade routes in our paper are Europe (including Africa), America (North and South) and Asia (including Oceania). The latter route is crucial for the study and subsequently is divided into three further regions like the East Asia route, which includes those Asian countries which were closer to Japan and with which it had strong colonial or other political relationships, the Southeast Asia route, including countries conquered by Japan and annexed to the empire during WWII, and the other Asia and Pacific route, with more distant Asia and Pacific countries with which Japan didn't have any economic nor political stake. We have 5 routes in total.

The next step was to find at least a representative freight rate (cost of transport per single ton of a determined product to a specific destination) for each route during the period 1912-1938. Cost of transport per ton mileage has been adapted to the different mile distance of Japan's trade partners for each route. East Asian freight rates were found in Yasuba (1978) and were based on the freight of coal between Nagasaki and Shanghai for the years 1910, 1920, 1930 and 1935. From this source we've also taken the freight rate of cotton between Japan and Bombay in 1912, which is employed as the basis for computing the Other Asia and Pacific freight rates. In both cases, the corresponding freights are translated to our benchmark years by using an index offered also in Yasuba's charts, which covers the years 1880-1940. Freights for the Southeast Asia route are found in (Ellinger & Ellinger, 1930) and are based on cotton manufactures freights between Osaka and Batavia in 1929, which are then translated to the rest of the years of interest using (Shimizu, 1988), which describes the percentage variations of general freights between Japan and Indonesia from 1902.

Additionally, for the European and American routes for which more freight information is available, we have chosen two freights as references: light (where the transport cost is small compared to the price) and heavy freights (where the opposite occurs). Specifically, they are tea on the London-Shanghai route (found at "Freights 1800-1938" http://www.uc3m.es/tradehist_db in (Federico& Tena-Junguito, 2019) and coal on the Wales-Hong Kong route obtained from (Isserlis, 1938), respectively, for the case of Europe. For the case of America, the freights are raw cotton and iron and steel between USA and Japan obtained from (Sanderson, 1926; Sanderson, 1940). It is necessary to mention that the different freight rates employed are denominated using different currencies and units of measure. However, all of them have been translated into sterling pounds per ton by using market exchange rates from (Federico & Tena, 2019) after taking equivalences between different units of measurement.

When we had obtained a complete series of freight rates (in pounds per ton) for each of our five routes, we translated them to every country belonging to each route. The procedure followed consists of dividing every route representative freight by the total distance covered (for example the East Asia freight is divided by distance between Nagasaki and Shanghai) in order to calculate the route specific cost of transport per ton and per mile.

Table B.2: Japan Freight rates in different routes (1912-1938).

	EAST ASIA	SOUTHEAST ASIA	SOUTH ASIA	EUROPE AND AFRICA LIGHT	EUROPE AND AFRICA HEAVY	AMERICAS LIGHT	AMERICAS HEAVY
1912	0.000135	0.000099	0.000217	0.000199	0.000169	0.000352	0.000176
1915	0.000190	0.000180	0.000213	0.000285	0.000208	0.000455	0.000506
1925	0.000188	0.000399	0.000615	0.000096	0.000167	0.000523	0.000299
1929	0.000176	0.000399	0.000607	0.000127	0.000175	0.000429	0.000245
1932	0.000133	0.000319	0.000504	0.000202	0.000109	0.000663	0.000379
1938	0.000328	0.000528	0.000488	0.000162	0.000113	0.000438	0.000166

Note: Data is expressed in Pounds per Ton per Mile

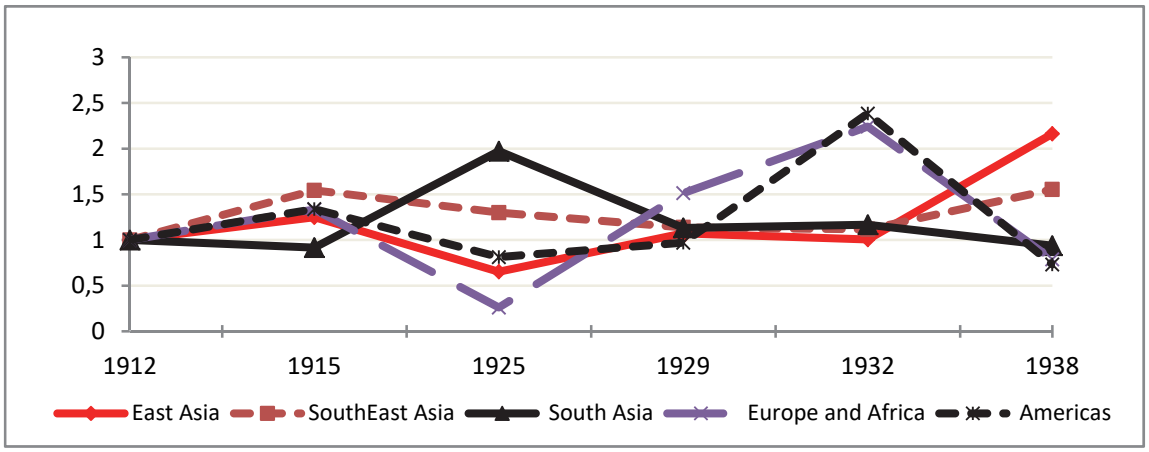
Source see text.

The next step was to multiply each of the route-specific freight rates above by the distance between Japan and the different countries inside every route, in order to build the freight rates of Japanese exports (pounds per ton) to each country. These freight rates are then divided by the international price in pounds per ton of each selected commodity (found in Federico & Tena-Junguito (2018, 2019). By doing this we obtain freight factors (cost of transport as a percentage of products' price for 5 goods (coal, cotton manufactures, raw cotton, tea and iron and steel).

Finally, to vary transport costs across different sectors we translate those 5 benchmark freights to the rest of products. We apply freight factor equivalences between products obtained in (Moneta, 1959), which employs freight factor equivalences for almost 80 products imported by Germany in 1951. The procedure consists of multiplying the freight factor of each route's reference product (remember, five routes, five different reference products) by the proportion that each corresponding good represents over the reference one. As an example, if the freight factor of meat is 5.3 times bigger than tea's freight factor (one of our references), then we multiply tea's freight factor by 5.3 in order to obtain the freight factor for meat exports. This process is repeated for each product. As a rule we assume that products sharing a 3-digit SITC

classification have the same freight factors. In addition we also assume that freight factor equivalences did not change too much between our period (1912-1938) and 1951.[78] Graph 1 shows the evolution of the freight factors created on this article by means of an index number (1912=100) capturing changes in the average freight factors for each trade route. Those averages have been weighted according to the proportion that each corresponding product possesses in total Japanese exports. The graph shows how freights fluctuate considerably, reflecting technological, market and trade composition factors, as opposed to distance, which is fixed. Furthermore, it is remarkable to observe that during the 1930s, the period in which Japanese exports towards East and Southeast Asia experienced their sharpest raise, freight factors to both routes increased.

Figure B.1: Freight Factor (trade-weighted by route) 1912-1938 (1912=100).



Source see text

In addition, there are other trade costs that are not related with transport. Average levels of tariff protection come from (Blattman et al., 2003) and represent total import duties collected by each country as a percentage of total imports.[79] This database has been extended following the same procedure using data obtained from the British Parliamentary Papers and the Annuarie Statistique de la France for their respective colonies all over the world (including Africa and the Caribbean). For other countries, we assume that levels of protection are the same as those of their respective

[78] That's a strong assumption but this is the best possible option for translating our freight factors to every single product exported by Japan.
[79] Tariffs between Japan and its colonies are assumed to be zero.

Metropolis.[80] All in all, we have data on tariffs for every country to which Japan exported during the interwar years.

On the other hand, exchange rates between every currency and the Japanese Yen (relative exchange rates) are obtained from (Federico & Tena-Junguito, 2019). This source gives nominal exchange rates between local currencies in different territories (among which Japan is included) and the dollar, expressed in local currency/dollar. The new rate is expressed in local currency per Yen and obtained through the division of partners' currency nominal exchange rate (foreign currency per dollar) by Japanese nominal exchange rate (Yen per dollar) and has been created for 44 partners. In other words, an increment of this variable reflects a relative nominal appreciation of the Yen. This assumes that nominal devaluation with the Yen affects trade independently of the behavior of their respective partners domestic price. Unfortunately, there is a scarcity data on domestic prices for the cross-section of countries, which impedes the inclusion of bilateral effective real exchange rates in our gravity equations. Nevertheless, this variable presents many different scales responding to the strength of each currency with which Japan traded. For exchange rate variable to really represent evolution of Yen acquisitive power we have decided to re scale it by constructing an index with base 1 in 1912. Furthermore, we have also obtained data on exchange rate controls obtained from various sources including (Bethell, 1994; Eichengreen, 1996; Meisel, 1990; Reinhart & Rogoff, 2002).

The last variable chosen to represent trade costs refers to the number of Japanese diplomats operating in each country, which has been obtained from Almanac de Gotha (various years), which includes a section with the names and country of origin of every diplomat operating in each country. We have meticulously counted the number of Japanese diplomats that worked in each country and the number of foreign diplomats that worked in Japan.

[80] An example of this could be the Canary Island on Spain. For an extended discussion on tariffs sources and methods see Appendix A.1.

Table B.3: Number of Japanese Diplomats Abroad.

	1912	1915	1925	1929	1932	1938
AFGHANISTAN						3
KENYA						1
FINLAND				1	1	2
MORROCCO						1
LEBANON						1
IRAN				1	4	5
ITALIAN AFRICA						1
GERMANY	15	RUPTURE	23	17	13	15
LATIVA						2
USA	21	22	33	27	23	22
HAWAII	1	1	1	1	1	1
PHILIPPINES	1	1	1	1	1	2
ARGENTINE	1	1	4	4	5	7
AUSTRIA-HUNGARY	8	RUPTURE	7	5	3	3
BELGIUM	6	6	12	8	7	6
BOLIVIA			1	1	1	1
BRAZIL	5	5	11	10	10	11
CHILE	4	4	6	5	5	5
CHINA	40	38	67	68	60	20
COLOMBIA			1			3
CUBA			1		1	1
DENMARK	1	1	1	2	2	1
EGYPT			3	2	2	5
SPAIN	4	3	7	4	6	3
FRANCE	13	10	25	22	18	13
FRENCH INDOCHINA	1	1	2	3	2	2
GREAT BRITAIN	16	14	32	21	17	19
INDIA	2	2	3	4	5	4
STRAITS SETTLEMENTS/MALASYA	1	1	2	1	1	2
CANADA	2	2	3	2	6	8
AUSTRALIA	3	2	6	1	1	2
NEW ZEALAND	1		2			
SOUTH AFRICA	1		1	1	1	1
HONG KONG	1	1	2	1	1	2
SRI LANKA	1	1	1	1		1
GREECE			2	2	2	
HUNGARY			1			
ITALY	13	14	16	14	9	9
LATVIA			3		1	2
LUXEMBOURG			1			1
MANCHUKUO				1		15
MEXICO	3	6	6	7	8	8
NORWAY	1	1	1	1	1	1
PANAMA			1	1		1
NETHERLANDS	5	5	7	5	4	5
INDONESIA	1	1	2	2	1	1
PERU	1	4	6	4	4	6
POLAND			4	6	4	6
PORTUGAL			4	3	1	4
ROUMANIE			5	4	2	2
EL SALVADOR						1
RUSSIA	14	18	1	23	18	16
SIAM	3		3	4	3	2
SWEDEN	4	5	10	6	5	2
SWITZERLAND	1	1	9	4	3	4
TURKEY			1	9	6	6
URUGUAY			1	1		

CZECHOSLOVAKIA			2	5	2	2
TOTAL	**195**	**171**	**344**	**314**	**266**	**256**

Sources: Japan's Diplomats abroad comes from Almanac de Gotha (various years)

Table B.4: Number of foreign diplomats in Japan

	1912	1915	1925	1929	1932	1938
AFGHANISTAN						2
EGYPT					1	1
CANADA				1	5	4
HONDURAS				1	1	1
IRAN						1
LUXEMBOURG				1	1	1
MANCHUKUO						11
NICARAGUA						1
DOMINICAN REPUBLIC					1	
EL SALVADOR				1		1
GERMANY	15	RUPTURE	8	11	10	12
USA*	20	19	32	18	26	35
ARGENTINA	3	3	2	3	5	2
AUSTRIA-HUNGARY	5	RUPTURE	1		1	1
BELGIUM	7	6	7	4	2	4
BOLIVIA		2	6	4	2	3
BRAZIL	9	6	7	4	6	5
CHILE	8	4	6	3	4	5
CHINA	20	16	19	12	14	30
COLOMBIA			2	1	1	2
CUBA			4	1	3	2
DENMARK	3	4	8	5	6	1
ECUADOR			1	1		
SPAIN	6	5	6	4	7	1
FINLAND			2	2	3	2
FRANCE* (1)	10	10	10	12	10	14
UK	24	22	21	19	20	19
GREECE		1	3		1	
ITALY	5	6	6	7	7	8
MEXICO	6	6	3	5	3	4
NORWAY	6	5	8	2	4	2
PANAMA			1	1	1	1
PARAGUAY			1		1	1
NETHERLANDS	7	9	8	5	8	5
PERU	2	2	5	6	3	4
POLAND			3	6	4	3
PORTUGAL	3	5	8	2	2	2
PERSIA					2	
ROUMANIA			1	3	3	4
RUSSIA* (3)	21	19	1	12	14	14
SIAM	2	2	3	3	4	4
SWEDEN	4	2	10	5	3	3
SWITZERLAND	2	2	2	2	1	2
CZECHOSLOVAKIA			3	3	2	3
TURKEY			1	1	2	5
URUGUAY						1
VENEZUELA		1	2		1	1
TOTAL	**188**	**157**	**211**	**171**	**195**	**228**

Sources: Foreign diplomats in Japan comes from Almanac de Gotha (various years)

Apart from the above mentioned determinants, we believe that the general

international protectionist backlash prevalent in Europe, the USA, and other relevant markets for Japan, such as India, during the 1930s influenced Japan's commercial focus on its empire and regional markets. In order to capture the global trade diversion generated by the Great Depression, we have included in our database a variable capturing the contraction of international trade over domestic demand represented by the GDP. It is represented by total imports for every Japanese country partner in each of our benchmark years. Information is obtained from (Federico and Tena-Junguito, 2019) and refers to total imports in current dollars. This source includes information for almost every Japanese trade partner. Exceptions are Hong Kong, Kwantung and Manchuria (1912-1929, our source contains information for 1932-1938), which were part of Japan's future dominions and colonial possessions, respectively. In order to account for these omissions, we have obtained Hong Kong imports from the British Parliamentary Papers (Statistical Abstract for the British Empire 1924-1938). The rest of the years have been extrapolated assuming Hong Kong exports to follow the same path as British Malaysia as both were British Colonies and were famous entrepôts (British Malaysia includes the Singapore entrepôt). To calculate Kwantung imports, we assume them to be equal to the proportion of Japanese imports based on the percentage of the population of Kwantung represented over the Japanese population and assuming parallel trends. Finally, Manchurian imports have been interpolated back from 1932 to the previous benchmarks by assuming imports to evolve at the same rate as its population.

The last set of variables we've added to the model are linked mainly with political factors that imply severe changes in trade costs related with the variations of the connection of different territories within the Japanese Empire. As has been explained in chapter 3, there are two forms: the first one consists of the Japanese creation of formal colonies in the conventional way and the second one, on the economic penetration that anticipated future conquests. We believe that both kinds of imperialism allowed Japan to reduce trade costs with its neighbors and we build two separate dummies for representing them. The first one captures Japanese trade bias towards its colonies, whereas the second tries to measure the extent to which Japan's interest towards its future conquered territories implied bigger exported quantities than what is suggested by the rest of the model's variables. The following tables summarize which countries were part of Japan's Colonies and future dominions and their main

characteristics.

Table B.5: Japanese Colonies Status and Main Features.

Japanese Colonies (Formal Empire)	Annexation Date	Period As Colony	Distance (Nautical Miles) With Japan	Pop 000s (1912)	Pop 000s (1938)	GDP Mill. 1990 Dollars (1912)	GDP Mill. 1990 Dollars (1938)	Tariffs (1912)	Tariffs (1938)	Share Over Japan's Exports (1912)	Share Over Japan's Exports (1938)	Main Product Traded (1912)	Main Product Traded (1938)
Taiwan	1895	1912-1938	920	3,411	5,552	2,297	7,252	0%	0%	7%	8%	Cotton Cloth	Sulphate Of Ammoniu m
Korea	1905 (Protectorate) 1910 (Colony)	1912-1938	449	10,422	15,381	8,789	24,895	0%	0%	8%	23%	Gray Shirtings	Iron Manufact ures And Gray Shirtings
Kwantung Leased Territories	1905	1912-1938	920	596	1,750	218	544	0%	0%	4%	14%	Gray Shirtings	Metals And Machiner y
Manchuria	1931	1932-1938	768	30,857	40,354	11,288	42,307	0%	0%	0%	8%	No Trade	Machiner y And Wheat Flour
China	1937	1938	735	432,37 5	513,33 6	158,17 6	288,65 3	3%	27%	19%	8%	Cotton Yarn	Spinning Machines And Wheat Flour

Notes: *Tariffs represent tariffs with Japan, except in the case of China in which they represent average tariff.*

Table B.6: Japanese Future Conquests and Main Features

Future conquests (informal empire)	Annexation date	Periods as informal empire	Distance (nautical miles) with Japan	Pop 000s (1912)	Pop 000s (1938)	Gdp millions 1990 dollars (1912)	Gdp millions 1990 dollars (1938)	Tariffs (1912)	Tarifs (193)	Share over Japan's exports (1912)	Share over Japan's exports (1938)	Main product traded (1912)	Main product traded (1938)
Manchuria	1931	1912-1929	768.4	30,857	40,354	11,288	42,307	0%	0%	0%	8%	No trade	Machinery and wheat flour
China	1937	1912-1932	734.9	432,375	513,336	158,176	288,653	3%	27%	19%	8%	Cotton yarn	Spinning machines and wheat flour
Hong kong	1942	1912-1938	1,341	450	1,479	164	300	0%	1%	4.7%	0.4%	Coal and cotton	Coal
British malaya	1942	1912-1938	2,777	3,025	5,207	2,486	7,089	3%	17%	1.5%	0.1%	Coal	Railways wagons
British borneo	1942	1912-1938	2,496	208	301	171	303	11%	20%	0.0%	0.0%	No trade	Iron manufacture
French indochina	1940	1912-1938	1,760	16,990	23,164	433	838	16%	8%	0.1%	0.1%	Coal	Asphalt and raw silk
Indonesia	1942	1912-1938	3,264	51,105	71,484	42,818	80,044	5%	10%	0.7%	2.6%	Coal and matches	Shirts and other textiles
Philippines	1942	1912-1938	1,432	9,206	15,934	8,390	22,948	12%	12%	0.9%	0.8%	Coal	Cotton under-shirts

Siam	1941	1912-1938	2,268	8,559	14,980	3,012	2,380	7%	28%	0.2%	1.0%	Steam vessels	Steam vessels
Burma	1942	1912-1938	2,359	12,220	16,145	7,348	11,942	13%	18%	0.0%	0.4%	No trade	Cotton tissues
Gilbert and ellice	1944	1912-1938	3,422	31	34	162	451	17%	20%	0.0%	0.0%	No trade	Jeans
New guinea	1942	1912-1938	2,484	380	670	1,979	4,186	16%	16%	0.0%	0.0%	No trade	Cotton manufacture

Notes: *Tariffs represent tariffs with Japan, except in the case of China in which they represent average tariff.*

B.2. Discussion

One of the biggest concerns regarding the exploitation of historical margins of trade records is related with the treatment of statistical sources. For example, the easiest way to compute trade margins is to assume that the extensive margin is represented by the total number of different goods exported by a country. This simple procedure was followed by (Huberman & et al, 2017) and we have replicated it as shown in Table 4.4 of the thesis.

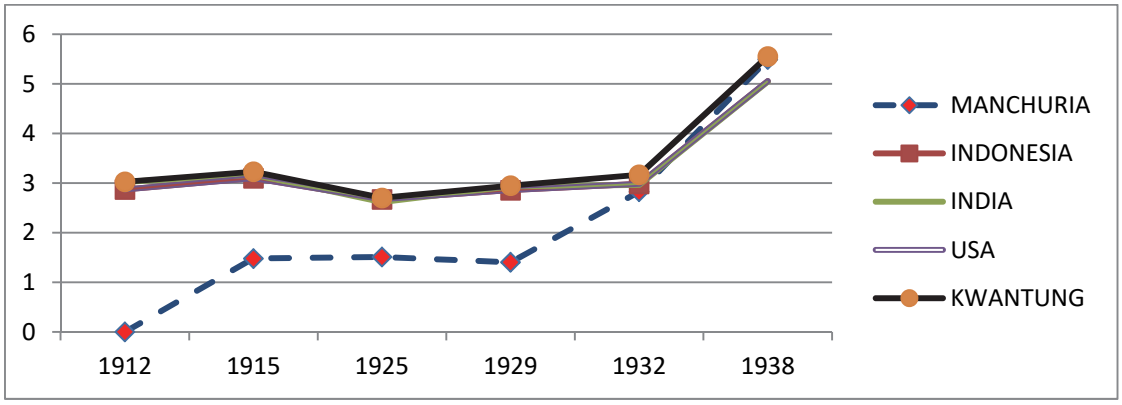
Nevertheless, the granular analysis of Japanese margins of trade might be biased because Japanese official records experienced an important increase in the number of products recorded. This phenomenon is wide spread across international trade records and it is related mainly with the increased diversification of tariffs on imported manufactures, the general improvements in trade bureaucracy and the standardization in the commodity classification of international records promoted by the League of Nations Brussels convention of 1913 and other conferences during the interwar years (Allen & Ely, 1953, ch4).

In this sense, increases in product coverage could overestimate our extensive margin of trade during the 1930s. This means that 1938 accounts for different product

varieties of the same good, artificially incrementing the number of goods exported by Japan.[81] Number of products and countries recorded by Japan statistics almost double between 1932 and 1938 and it is difficult to capture differences between varieties and new goods. If the extensive margin collects the number of new products and countries exported by Japan, it will be much higher in 1938 than in 1932, but this could merely reflect statistical modification rather than a structural change in Japanese manufacture exports.

Figure B.2 provides partial confirmation of this phenomenon. The number of product varieties in the same sector exported to different countries increased in all cases around 100% between 1932 and 1938, thus artificially raising the number of goods exported by Japan.

Figure B.2: Japanese average number of products exported in 3-digit SITC sector by region.



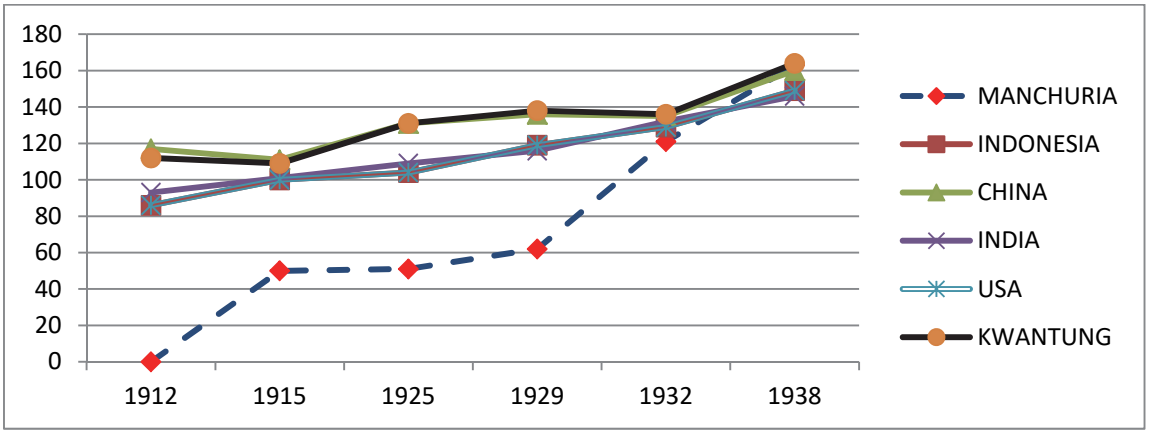
Source: Annual Return of trade for the Empire of Japan (various years).

The database constructed includes the value of Japanese exports (in current Yen) of each product exported to each country. Each different product exported has been categorized using the 2nd Revision of the Standard International Trade Classification (SITC) at a 5-level digit disaggregation in order to achieve a proper and precise product classification. This categorization also permits us to distinguish new export products from those exports that are simply different varieties of the same product. For that purpose, products sharing the same 3-digit classification compose a single product category or sector used in this paper. This is similar to the strategy employed by

[81] Japan exported 512 different products to 36 different countries in 1912, 544 to 36 in 1915, 697 to 43 in 1925, 671 to 44 in 1929, 660 to 49 in 1932 and 1135 goods to 117 in 1938.

(Meisner & Tang, 2018). Through this method we observe that Japanese industrialization and imperial mechanisms, along with reductions in trade costs, permitted Japan to increase exports from 117 to 164 sectors, as can be observed in figure B.3.

Figure B.3: Japanese number of exporting sectors by region.



Source: Annual Return of trade for the Empire of Japan (various years)

In any case, results appreciated on table B.7 show that conclusions obtained on the core of the thesis regarding margins of trade are not affected by changes in the conceptualization of margins.

Table B.7: Japanese Export Determinants at the Margins of Trade.

VARIABLES	(1) Total Extensive	(2) Total Intensive	(3) Extensive HS	(4) Extensive LS	(5) Intensive HS	(6) Intensive LS
GDP	0.325***	1.428***	0.245**	0.164	0.534*	0.958***
	(0.120)	(0.341)	(0.110)	(0.116)	(0.292)	(0.322)
RELPRODUCTIVITY	-0.0880	0.146				
	(0.290)	(0.320)				
REL PRODUCTIVITY HS			0.189		0.623***	
			(0.141)		(0.183)	
REL PRODUCTIVITY LS				-0.239		0.612***
				(0.324)		(0.173)
RELWAGES	0.180	0.697**				
	(0.215)	(0.285)				
RELWAGES HS			-0.287		0.381	
			(0.199)		(0.354)	
RELWAGES LS				0.474**		0.459
				(0.202)		(0.374)
POPDENSITYDIFF	0.0325	0.346*	0.0262	0.0829	0.240*	0.170
	(0.0666)	(0.206)	(0.0805)	(0.0824)	(0.133)	(0.152)
GDPCAPABSDIFF	0.0668	1.016**	0.153	0.0975	1.139**	0.0419
	(0.260)	(0.397)	(0.262)	(0.252)	(0.474)	(0.329)
FREIGHTS	-0.287**	0.0842				
	(0.140)	(0.308)				
FF HIGH SKILL			-0.458***		0.0980	
			(0.121)		(0.192)	
FF LOW SKILL				-0.414***		-0.382
				(0.141)		(0.270)
EXCHCONTROL	-0.295	-1.173	-0.623**	-0.413*	-1.258*	-0.726
	(0.239)	(0.875)	(0.270)	(0.233)	(0.660)	(0.530)
EXCHRATE	-0.168***	-0.316***	-0.176***	-0.162***	-0.337*	-0.340***
	(0.0531)	(0.105)	(0.0606)	(0.0493)	(0.175)	(0.0826)
TARIFF	-0.177*	-0.528***				
	(0.0963)	(0.181)				
TARIFFS HS			0.0171		-0.0319	
			(0.0746)		(0.0861)	
TARIFFS LS				0.00926		-0.526***
				(0.0786)		(0.120)
COLONY	0.835*	1.782**	0.762**	0.458	4.091***	3.270***
	(0.442)	(0.875)	(0.342)	(0.433)	(0.436)	(0.502)
FUTURE CONQUESTS	0.855***	0.533*	0.571	0.541	1.438***	3.413***
	(0.246)	(0.285)	(0.397)	(0.395)	(0.397)	(0.660)
DIPLOMATS	0.141*	0.0177	0.173**	0.153**	-0.168	-0.0727
	(0.0737)	(0.131)	(0.0741)	(0.0758)	(0.154)	(0.235)
IMPORTS	0.0291	0.0999	0.0175	0.0293	0.530***	0.167***
	(0.0402)	(0.0757)	(0.0378)	(0.0352)	(0.181)	(0.0396)
Constant	0.506	-10.21**	-0.466	-0.833	-10.87***	-5.229*
	(1.712)	(4.316)	(1.535)	(1.515)	(2.726)	(3.053)
Observations	674	674	676	676	676	676
R-squared	0.596	0.639	0.590	0.521	0.713	0.636

*Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*

A second item that we consider relevant for discussion is the role that textile

exports had in Japanese industrialization. The first thing we will do in this section is to clarify the criteria employed for dividing the different products exported by Japan into skill layers. We have adapted the 3 digit SITC categorization to a contemporaneous group of 16 manufacturing sectors following the (British Board of Trade, 1905) classification of British manufacturing exports. We have ranked these according to skill intensity following (Tena-Junguito, 2010). Table B.8 shows these manufacture sectors ranked from high to low median earning workers at the turn of the century (High skilled (skill intensity between 11 and 13, ranked 1-6), Medium skilled (skill intensity between 9 and 10, which are ranked from 7 to 9) and Low skilled manufactures (between 5 and 8 skill intensity, ranked from 10 to 16). This strategy, suggested by (Num and Trefler, 2009), consists of differentiating high and low cut-offs inside the ranking to categorize in a more effective way high skills and low skill sectors. This strategy is hopefully less vulnerable to technological change during the first third of the twentieth century.

We have extended this strategy to primary products as a residual (assuming less skill intensity than in manufactures). Thus, we work with a simple division between high skill sectors that were more influenced by the second industrial revolution technologies and those that were less influenced. We recognize that, on one hand, this division represents a very rudimentary of capturing skill improvements inside sectors, specially productivity increases in Japanese textile industries in the 1920s and 1930s (Wolcott, 1994), but on the other hand, this strategy captures better Japan's manufacturing dual aggregate sectorial advance in the second industrial revolution technologies as an indicator of industrial modernization in the inter-war years, which is the main objective of the paper.

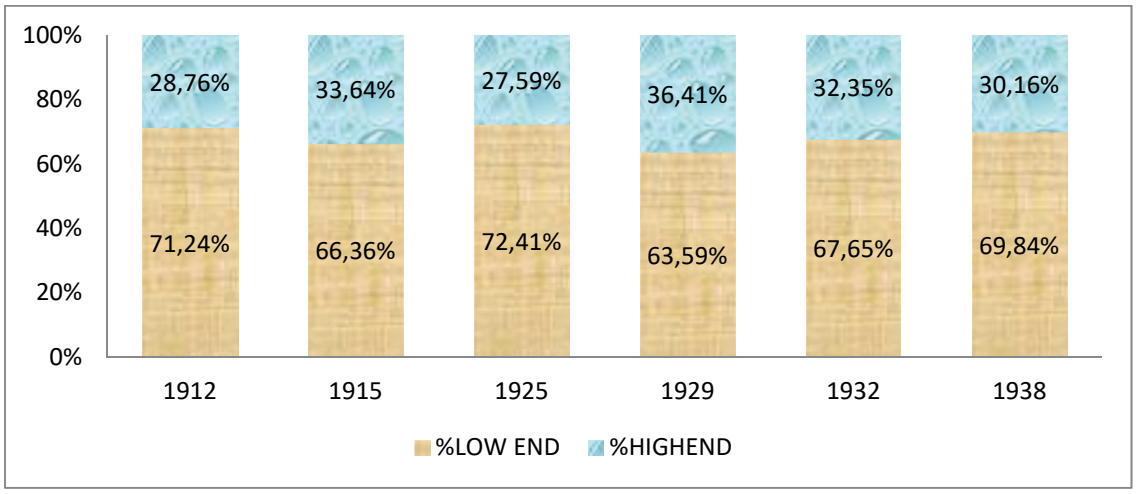
Table B.8: Skill intensity ranking.

Ranking	Description	skill intensity	
1	Ships	13,01	
2	Machinery hardware&c	12,65	
3	Paper Manufactures	11,65	
4	Silk thrown	11,58	
5	Iron Steel Manufactures	11,29	
6	Leather and Manufactures	11,00	high cut-off
7	Copper lingots, Cakes, Slabs	10,01	
8	Alkali Chemical products	9,64	
9	Apparel	9,27	
10	Woollen & Worsted Manufactures	7,9	low cut off
11	Linen Manufactures	7,8	
12	Cotton Manufactures	7,74	
13	Jute Canvas and Sacking	7,04	
14	Woollen yarns(stuffs all wool)	6,2	
15	Linen Yarn	5,9	
16	Cotton yarns undyed	5,8	

Sources: See Tena-Junguito (2010)

In order to ascertain how the destination of Japanese exports varied across time, and which dynamics they followed according to economic and political circumstances, it is pertinent to exploit the possibilities offered by the granular database employed in the paper. For example, it has permitted us to further divide Japanese textile exports between high-end, or highly sophisticated textiles, and low-end ones. The first category includes apparel or finished clothing, the skill intensity of which is higher than 8, whereas the second category includes piece goods, yarns and other unfinished textiles with a skill intensity lower than 8**.**

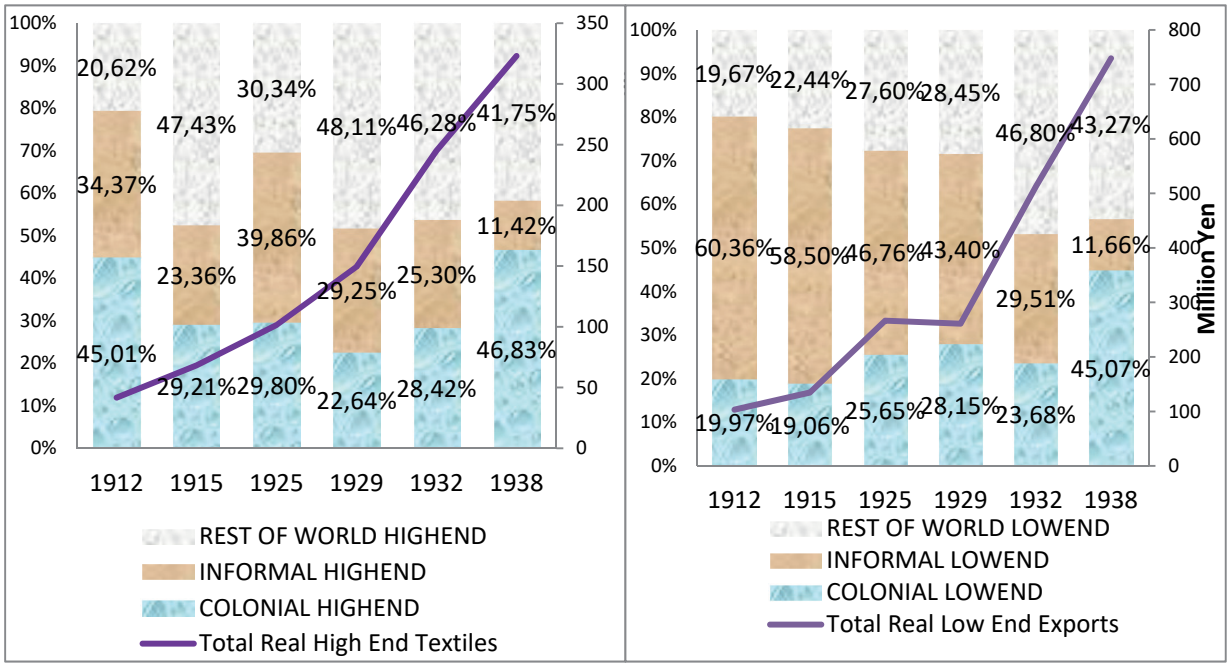
Figure B.4: Share of low-end and high-end textiles over total Japanese textile exports.



Source: Annual Return of trade for the Empire of Japan (various years).

We note that most textile exports were low-end; that is, cotton yarns, threads and other kinds of piece goods represented around 65-70% of the total, in contrast to clothing and apparel, which represented between 25% and 30% of textile exports.

Figure B.5: Distribution of low-end and high-end Japanese textile exports by regions (1912-1938).



Source: Annual Return of trade for the Empire of Japan (various years).

Furthermore, it is interesting to observe the market behavior of both kinds of exports. In both cases we can appreciate a transition from a focus on controlled territories to a distribution outside the Japanese sphere of influence, which ends after

1932, the year in which Great Britain and other powers diverted trade to their empires and in which Japan, as a consequence of this and of its invasion of Manchuria, decided to launch an empire-based development strategy.

This transition is more evident in the case of textiles, located on the bottom part of the skill intensity distribution. Beginning in 1912, it is evident that they are mainly exported towards countries composing the Japanese informal empire in Southeast Asia (60%). According to the dynamics followed by other sectors in the Japanese economy, low-end textiles were first directed towards Japanese colonies which were politically and economically controlled by Japan. Once they achieved a certain degree of competitiveness, they were exported towards countries in the informal empire. After that, we can clearly appreciate a diversification of low-end textile exports towards the rest of the world, suggesting that Japan had reached a certain competitive threshold both regionally and internationally. This phase started in 1929, coinciding with the period in which Japanese low-end textile exports experienced their largest increase. The transition of high-end textiles is less gradual but also appreciable and, in both cases, the biggest increase in exports coincides with the opening towards new markets. Furthermore, it seems that high-end textiles were introduced sooner to international markets than low-end ones, suggesting that they were more responsive to market factors.

All in all, according to the literature and the data we have presented, both low- and high-end textile exports followed a similar tendency, in which they seem to have displaced productive and international market characteristics, at least to a much higher degree than high skilled manufactures, which were extremely concentrated inside the empire. Both kinds of exports experienced a strong imperial bias after 1932, with a very similar shape, but with a clear lower bias than that experienced by the high skilled industrial exports.

This intuition can be verified following our Gravity Model for analyzing the determinants of both high- and low-end textile exports. The variables employed have been the same as the ones used in the main paper since we haven't been able to obtain reliable variables presenting a higher degree of disaggregation. For example, productivity reflects GDP per hour worked in the overall textile sector related to total GDP per worker in partner countries.

Table B.9: Determinants of high- and low-end textile exports

VARIABLES	(1) High-End Textiles	(2) Low-End Textiles
GDP	0.909***	0.588***
	(0.220)	(0.213)
REL PRODUCTIVITY TEXTILES	1.395***	1.246***
	(0.205)	(0.167)
RELWAGES TEXTILES	0.939***	0.503
	(0.304)	(0.330)
POPDENSITYDIFF	0.530**	0.554***
	(0.230)	(0.127)
GDPCAPABSDIFF	0.395	0.335
	(0.462)	(0.380)
FFLOWSKILL	-0.378*	-0.284*
	(0.210)	(0.171)
EXCHCONTROL	-0.626	-0.468
	(0.401)	(0.414)
EXCHRATE	-0.544***	-0.567***
	(0.0981)	(0.100)
TARIFF LS	-0.324***	-0.273***
	(0.109)	(0.0959)
COLONY	2.955***	3.004***
	(0.424)	(0.364)
FUTURE CONQUESTS	2.448***	2.461***
	(0.490)	(0.437)
DIPLOMATS	0.107	0.303**
	(0.0843)	(0.125)
IMPORTS	0.182***	0.140***
	(0.0492)	(0.0313)
Constant	-4.496	0.488
	(2.975)	(2.352)
Observations	676	676
R-squared	0.791	0.779

The results show that productivity played a role in determining these kinds of exports, which is larger than the one it played in other sectors. This suggests that Japanese comparative advantage played a relevant role in the expansion of textile

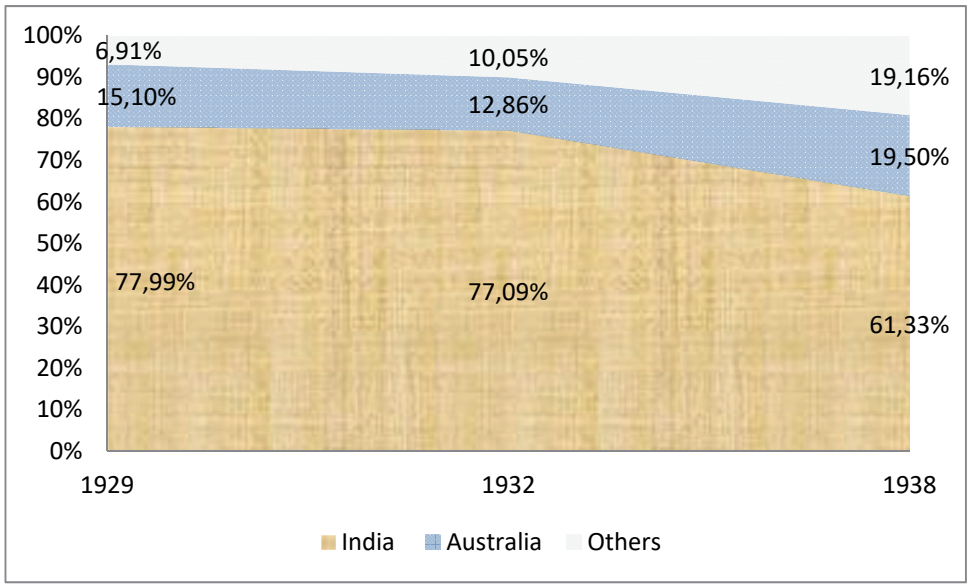
exports and its strength was similar at both ends of the skill classification. Contrary to high skill manufactures, textiles were driven by productivity with the difference that a relevant share of their exports were directed towards colonies and future conquered territories, although both kinds of textiles were more biased towards the first than to the second. Interestingly, we can also appreciate that high-end textiles were slightly more responsive to changes in comparative advantage variables and less sensitive to imperial controls.

Both low- and high-end textiles were first introduced in the colonies, then in the Japanese future conquests territories, and once they became internationally competitive, they were distributed all over the world. What's more, they demonstrated significant expansion in the world market in spite of the backlash bias towards its colonies experienced after the reaction of the British Commonwealth Trade Bloc to the Manchuria invasion that partially excluded Japanese textiles from India and other markets. In addition, the comparison with second industrial revolution exports and the fact that productivity played a bigger role in determining textile exports, along with the dynamics presented above, suggest that textile exports responded more to productivity determined comparative advantage than high skilled manufactures, which were more strongly affected by Japanese imperial aims.

Following the discussion we believe that we should provide an extended explanation about how the Great Depression and the creation of colonial blocs all over the world after the Ottawa agreement affected Japanese manufacturing exports towards the region**.** The reasons behind Japan's considerable commercial concentration in its colonies and neighboring countries inside the region are varied and not fully reviewed in the thesis. Many authors view the Japanese invasion of Manchuria in 1931 as a turning point in the sense that after this great victory, the military gained important political power that permitted them to continue lobbying the government for a continued pursuit of imperial expansion. Of course, this historical event was of relevance to the subsequent commercial, economic and political decisions adopted by the Japanese Government during the 1930s, as were the needs of the Japanese Zaibatsu for gaining access to bigger markets and achieving economies of scale in a context of a protected market with monopolistic privileges. Nevertheless, there are other factors that might have also facilitated Japan's strong focus on its empire as a source of exports. In that sense, the international landscape might have played a significant role.

First of all, after the 1929 crash, GDPs declined rapidly and the collapse of international demand was reinforced by a generalized increase of *beggar my neighbor* policies with increased tariffs, competitive devaluations, and the creation of new trade blocs. Differences in international and domestic demand declines are captured in our regressions. In that sense, the immediate Japanese response was to focus on exerting its comparative advantage on closer markets, especially in India, which was by far the largest accessible market for Japan apart from its colonies at that time. This can be appreciated in Figure 4.3 in the thesis main body (Other Asia and Pacific share raise from 18% to 24% after 1929) and also in Figure B.6 in the present appendix in which we can see how the vast majority of manufacturing exports towards this region are concentrated on India.

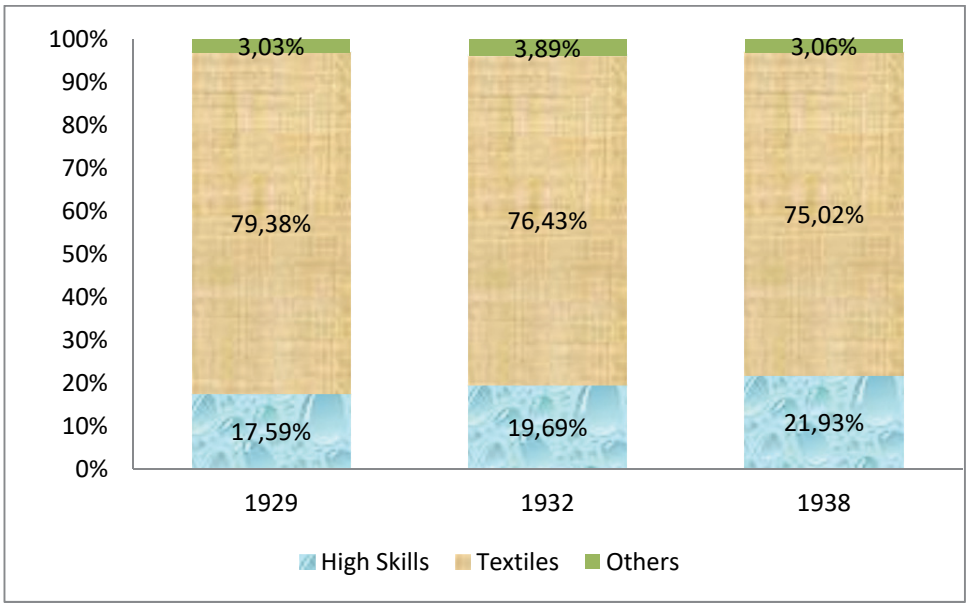
Figure B.6: Distribution of Japanese Manufacturing exports towards Asia Pacific territories outside Empire.



Source: Annual Return of trade for the Empire of Japan (various years).

Regarding the kinds of products and the competition faced by Japan in its territory, it is remarkable how Japan concentrated its manufacturing exports to India on textiles as shown in Figure B.7.

Figure B.7: Distribution of Japanese exports to India 1929-1938



Source: Annual Return of trade for the Empire of Japan (various years).

As shown in Table 4.1 of this dissertation, Japan enjoyed comparative advantage in the production of textiles. This is also confirmed by (Robertson, 1990; Wolcott, 1994), who mention that during the interwar years, specially the 1930s, Japan became the world's main exporter of cotton textiles. According to the former author, the main competitor of Japan on the Indian market was Great Britain, which also enjoyed political privileged access to the territory. Competition grew in intensity during the 1920s, but Great Britain didn't give much importance to the growth of Japanese cotton textile exports to India since they attributed them to the 1924 Yen devaluation. Indeed, time proved the British correct because, after the Japanese financial crisis in 1927 and subsequent increase in the price of Yen, Japanese exports to India decreased.

Nevertheless, Japanese cotton textile production enjoyed other advantages over the British than lower labor costs or exchange rate depreciation. The large scale of Japanese textile producers, the high level of integration between firms, the tendency to concentrate on a reduced set of product varieties and the closer links between producers, suppliers and merchants, provided a cost advantage that the British producers couldn't match. This advantage also allowed the Japanese to surpass the British in cotton textile exports not just to India, but also in other markets traditionally dominated by the British, like China or East Africa. All in all, it seems that the commercial performance of the Japanese outside its empire was dominated by textile exports, in which it was the

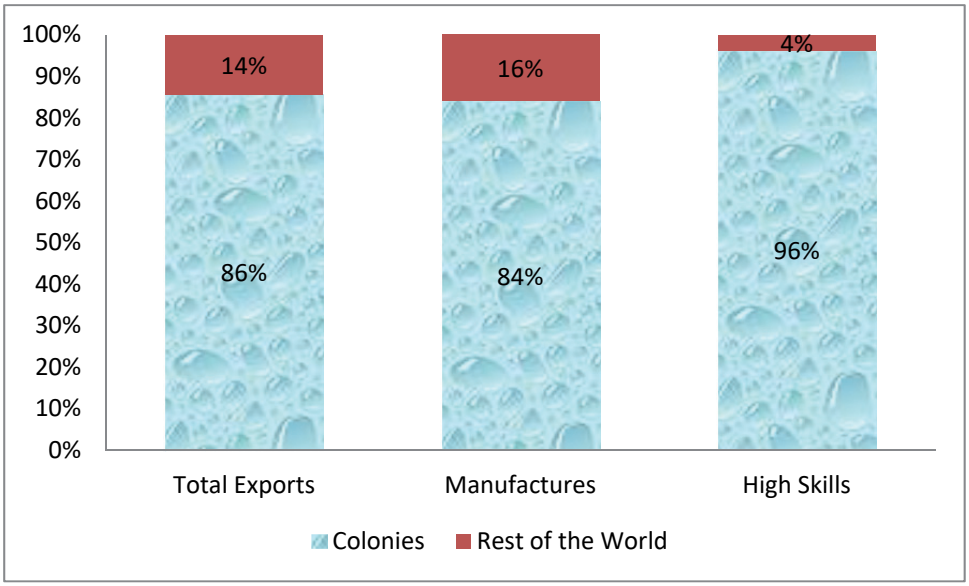
leading exporter, and this performance was possible thanks to factors awarding the sector comparative advantage.

The largest increase of exports to India during the Great Depression might be also related with the Yen's devaluation after 1931, which was larger than that of the sterling pound. Between 1929 and 1932, Japanese exports towards its empire experienced a reduction due to the Chinese boycott in retaliation of Japanese military campaigns over Manchuria in 1931. This fact could have also forced Japan to diversify its exports towards territories like Australia, Africa or Ceylon. In each of these territories, Japanese cotton textiles enjoyed a comparative advantage over British ones.

For this reason, the British response to Japanese competition in cotton textiles in India came in the form of imposing higher tariffs and quotas after 1932 and forcing them to negotiate to raise their prices. This would have provoked the retreat of Japanese exports from British India appreciable in previous graphs, and may explain the strong Japanese focus on its empire which is observed in 1938 exports. Paradoxically, the share of Australia was increased at that time, but it could be probably explained by the fact that tariffs in Australia were already among the highest in the world before Ottawa (Glickman, 1947). Those exports were, as shown in the paper, not dominated by comparative advantage, but rather by other political motives and focused on high skilled manufactures.

Finally, we must address concerns regarding the special intensity of high skill exports towards Japanese colonies by we offering evidence that proves that this bias is not only explained by the fact that those exports started from very low initial levels. In order to do so, we have calculated increases in total, manufacturing and high skilled exports for the period in which they rose the most (1932-1938) and have computed the colonial share of these increases. The results clearly show a colonial bias, as colonies represent 86% of the increase in total exports. This proportion is slightly reduced when we examine the increase in total manufactures (84%). But the evidence is conclusive, showing that Japanese colonies were by far the main destination market of high skill manufactured exports after 1932, representing 96% of the total increase. In other words, figure B.8 shows the colonial bias of Japanese total and manufacturing exports and that this bias was much higher for high skilled manufactures.

Figure B.8: Japanese exports increase 1932-38 (%) by groups of products and region.



Source: Annual Return of trade for the Empire of Japan (various years).

Finally, the discussions practiced on this section about the role of the Great Depression and Ottawa agreements in Japanese exports regionalization made us wonder about the role of Japanese colonies as a market for the mainland. In principle we believe that colonial trade was severe enough at every period, even if increased intensity during the 1930s.

Nevertheless, there is an option that Japan only used its colonies as a market of last resort in the 1930s as a consequence of trade diversion produced by global disintegration. Table 4.6 on the thesis core, shows that Japanese trade with its colonies was very similar to the one with informal empire territories, with a remarkable intensity only for 1938. Tariff policy in the Japanese occupied territories privileged Japan or was assimilated into Japan's own tariff system before 1930´s. Korea adopted Japan's tariff system in 1923, as would Manchuria ten years later upon the territory's separation from the Chinese custom system, allowing preferential access for Japanese manufactures. Japan exported to its dominions before international trade blocs were in force diverting Japan trade from international markets. Surely international context reinforced Japan connections with colonies in greater extent than on future conquered lands. However, for a definitive answer to the main question there is a need to analyze Japan total exports not just imperial ones.

In that sense, table B.10 shows how Japanese trade with its colonies was at every period more intense than to the rest of the territories, including informal empire. With coefficients bigger and time invariant. In short, colonial demand of Japanese exports was strong enough at every period to avoid being branded as market of last resort.

Table B.10: Japanese Total exports determinants by time period (1912-1938)

	(1)
VARIABLES	EXP
GDP	0.906**
	(0.401)
RELPRODUCTIVITY1915	-0.127
	(0.429)
RELPRODUCTIVITY1925	-0.0895
	(0.510)
RELPRODUCTIVITY1929	0.118
	(0.356)
RELPRODUCTIVITY1932	0.505
	(0.396)
RELPRODUCTIVITY1938	0.289
	(0.219)
RELWAGES	0.428
	(0.340)
DIFFPOPDENSITY	0.434**
	(0.187)
GDPCAPABSDIFF	1.530***
	(0.444)
FREIGHTS	-0.275
	(0.240)
EXCHCONTROL	-0.966
	(0.700)
LNEXCHRATE	-0.880***
	(0.269)
TARIFF	-0.163
	(0.169)
IMPORTS	0.393**
	(0.189)
COLONY1915	2.659***
	(0.834)
COLONY1925	3.163***
	(0.812)
COLONY1929	2.924***
	(0.775)
COLONY1932	2.652***
	(0.908)
COLONY1938	3.323***
	(0.810)
OCCAFTER1938	1.056***
	(0.314)
JPNdiplomats	0.137
	(0.125)
Constant	-8.697
	(5.304)

Observations	633
R-squared	0.662

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

B.3. Econometric concerns and counterfactual exercise.

Another important concern related with this article and with papers in general dealing with export determinants and productivity is precisely the possible endogeneity between the key variables. For example, productivity increases may be affected by export expansion. The mechanisms are related with the fact that exogenous changes in trade costs might also generate improvements in productivity through economies of scale (the market expands and unit costs reduce) or experience (increasing production might lead to learning by doing and reduced costs). For that reason, the first test we are going to run in this section is to check whether increases of exports generated improvements in productivity in Japan.

Table B.11: Effect of export increase on productivity.

VARIABLES	(1) Rel productivity	(2) Rel productivity	(3) Rel productivity	(4) Rel productivity	(5) IV
logrelativeopen	-0.0721				
	(0.0795)				
logexports		0.0418			
		(0.0261)			
logexportsHS			0.0572**		
			(0.0257)		
logexportsLS				0.0949***	
				(0.0344)	
ivexports					-0.0251
					(0.0429)
Constant	-0.381***	-0.877**	-0.367	-1.293***	0.177
	(0.0482)	(0.368)	(0.315)	(0.443)	(0.673)
Observations	123	140	131	133	149
R-squared	0.012	0.034	0.068	0.135	0.003

In order to do so we follow an approach similar to that of (Huberman et al., 2017), first, we check whether improvements in openness (increases of Japanese exports as a percentage of GDP) generated increases of Japanese productivity (measured as non-agrarian GDP per hour worked). The same has been done using nominal exports or high and low skill manufacturing exports. Finally, an instrument has been created which

is called *ivexports* and is constructed by the predicted value of exports regressed on the usual variables with the exception of productivity measures.

$$\text{IVEXPORTS}=\beta_0 + \beta_1 lnGDP_{it} + \beta_2 CA_{it} + \beta_3 TC_{it} + \beta_4 COLONY_{it} + \beta_5 FUTURE\ CONQUESTS_{it} + \beta_6 IMPORTS_{it} + \beta_t + \varepsilon_{it}$$

The results show that in general increments of exports didn't increase Japanese productivity. However, there is a perceivable effect at the skill level, although the effect of increases of high and low skilled exports on productivity is very weak. In other words, the results in table B.11 permit us to reject the possibility that productivity growth was endogenous to export growth for the case of 1912-1938 Japan.

Another possible source of endogeneity could be present in trade costs in the sense that their causality relation with exports might be bidirectional. The clearest example is that of diplomats, since increases in the number of Japanese diplomats in a country might increase Japanese exports to that country, but the fact that Japan is trading with the country might also attract a larger number of Japanese consuls there. This possibility is real, as is demonstrated in Table B.12, in which the value of Japanese exports affected in a positive and significant way the number of Japanese Diplomats abroad, the number of foreign diplomats in Japan and total Diplomatic representation (the sum of diplomats abroad and foreign diplomats in Japan). Furthermore, this phenomenon could also appear in the rest of trade costs or even in productivity measures.

Table B.12: Effect of Changes in Exports on the Number of Japanese Diplomats Abroad

	(1)	(2)	(3)
VARIABLES	Japan Diplomats abroad	Diplomats in Japan	TOTAL DIPLOMATS
logexports	0.271***	0.232***	0.232***
	(0.0433)	(0.0221)	(0.0395)
Constant	-2.731***	-1.622***	-1.537**
	(0.669)	(0.362)	(0.609)
Observations	327	165	327
R-squared	0.170	0.541	0.165

For that reason, it is important to ascertain whether the dependent variable (exports) is not affecting the independent variables, because it would lead to distorted and biased effects of trade costs on export growth. In order to do this, we take lags of every independent variable so as to avoid them being affected by changes in exports, as current exports can't affect past trade costs.

Table B.13: Japanese Exports Determinants (Lagged Independent Variables)

VARIABLES	(1) EXP
GDP	0.977***
	(0.300)
RELPRODUCTIVITY	0.544*
	(0.292)
RELWAGES	0.125
	(0.140)
GDPCAPABSDIFF	1.035**
	(0.408)
POPDENSITYDIFF	0.601***
	(0.125)
FREIGHTS	-0.219
	(0.177)
TARIFFS	-0.338**
	(0.140)
EXCHCONTROL	-1.757
	(1.097)
EXCHRATE	-0.457***
	(0.109)
COLONY	2.638***
	(0.706)
FUTURE CONQUESTS	0.832***
	(0.305)
DIPLOMATS	0.375***
	(0.109)
IMPORTS	0.156*
	(0.0861)
Constant	-4.937
	(3.044)
Observations	673
R-squared	0.741

Table B.13 shows export determinants lagged by one period, and we can see that the main results still hold when we account for the effect of trade determinants on exports one period ahead. By doing this, we avoid partially the inverse effect of export growth on trade determinants. In addition we confirm that changes in productivity and trade costs affected Japanese exports in the future period.

All in all, throughout the whole chapter we have been trying to determine the real effect that imperial connections had in Japanese total exports, especially during the 1930s, which were the years in which trade was more biased towards the Imperial Bloc. Nevertheless, the results obtained only bring insights but don't quantify the overall bloc impact. Furthermore, those results aren't even comparable with other similar studies, something that doesn't permit this paper to be fully comparable with related literature. For trying to solve these drawbacks we are going to construct a counterfactual exercise

that is intended to show approximately the level of Japanese exports in case the Empire had never existed.

The strategy is going to consist on an estimation of Japanese overall exports in case it hadn't enjoyed imperial benefits inside the region. This exercise would imply that exports towards regional countries would have evolved following the same path as those towards neighbor territories with which Japan never enjoyed any privileged economic connections. In that sense, the two main territories presenting those characteristics were India and Australia, so we are going to assume Japanese exports towards the remaining regional neighbors is going to follow the same path as those two British colonies for the period 1932-1938.

The exercise is far from realistic because each territory is subject to different characteristics that we are not controlling for. In order to try to solve this drawback we will exploit differences between the two base countries: British India trade policy towards Japanese products turned to be really restrictive after Ottawa agreements in 1932 and for that reason Japanese exports towards this territory didn't increase and were even slightly reduced for the 1932-1938. On the other hand post Ottawa tariffs on Australia were not as binding (see previous section), permitting a raise in Japanese exports towards this territory. For that reason, the counterfactual using India as a base will be considered a lower bound for the evolution of Japanese exports without empire, whereas the Australian one will be an upper bound.

According to our calculations, if regional exports would have followed the same pattern as Australia, total Japanese exports would have been 28% lower. What's more, if they had followed the same evolution as India, total Japanese exports would have been 47% lower. Overall it seems that imperial connections permitted Japan to enjoy an exports increase ranging between 28%-47% according to our estimates. The imperial effect gets much bigger if we account for increases on high skilled manufacturing exports. Specifically, without imperial connections, Japanese high skilled exports would have been between 66% and 76% lower.

C. UNDERSTANDING JAPANESE COLONIZATION OF MANCHURIA.

C.1. Sources and estimation procedures

The control variables for regressions using Japanese exports to Manchuria as the dependent variable have been constructed using data from (Ohkawa et al.,1967-1989). This database contains information about export prices, wages of workers, production or total exports for Japanese main exported commodities. In order to adapt them to the sectors artificially constructed for our purpose using SITC Rev 2 we are obtaining data for the main commodity exported inside each sector and assume the whole sector to present the same data as this one.

For sectors like beverages, comestibles, chemicals, machinery or miscellaneous this assumption is straightforward because the employed data source presents overall information for each of them. On the other hand, information for sectors like unfinished manufactures is represented by textiles, finished manufactures by iron and steel, animal and vegetable oil by fishery because most animal oil was fish oil, mineral fuels are represented by mining products and crude materials by wood and wood products, because the leading crude material exported was wood.

C.2.Discussion.

The following section will extend explanations about the mechanisms linking South Manchurian Railway Company freights and Japanese exports of machinery, their role on Manchurian industrialization and a description of company composition of those exports. In addition, we will discuss the military influence over Manchurian exports to Japan.

One of the main objectives in this thesis is to demonstrate how national interests can shape economic and business outcomes in determined territories and how certain companies could win by cooperating with the ruling elites. In order to do that, we employ the case of the Japanese colonization of Manchuria as an example of this process denominated as Elite Exchange.

In short, chapter 4 provides a set of mechanisms by which the Kwantung Army, a branch of the Japanese Army, was able to influence Manchurian economic landscape to its own will. The most relevant one was the control exercised over the transport network by establishing a new price system on the South Manchurian Railway

Company, the semipublic company that monopolized the railway transportation in Manchuria. Specifically, this pricing system worked on a distance base, reducing the price per mile transported towards the more distant destinations. The following section is devoted to extend the explanation about how this new price system extraordinarily favored the industrialization plans launched by the Kwantung Army in Manchuria. In that sense, for a more convenient explanation it is necessary to study the map of Manchoukuo State.

Map 3: Manchoukuo State frontiers and main industrial centers (1932-1945)

Source: Pinterest

First of all, one must realize that the Five Year Plans of industrial development in Manchuria placed a strong emphasis on basic metals (iron and steel) and chemical production, which was sustained in Japanese machinery and expertise. The primary objective was that those industries were able to supply the Japanese economy which from 1937 onwards was totally mobilized for war purposes. Nonetheless as explained on the core of the thesis, the excess supply required for Manchuria in order to be able to export Japan was rarely achieved and only pig iron was exported in significant amounts to the homeland after 1941. The rest of steel and chemical commodities were basically devoted to internal consumption.

Secondly, we should notice that the new price system didn't benefit transport of raw materials from Fushun or Anshan mines because pig iron plants were located on these same territories, next to the mines (10 to 30 miles). The resulting commodity was

employed as a raw material on the production of steel on Anshan and Shenyang factories, once again close to iron companies. Something similar happened with chemical production as main chemical plants were located at Anshan and Dalian in the South and employed coal byproducts from iron and steel neighboring companies in order to produce sulfate of ammonia and sulfuric acid.

Anyway, although cheaper railway freights to distant cargoes neither benefit exports to Japan as it was originally planned nor transport of raw materials from the mines to the factories, they still favored internal resource mobilization for military sake. The reason was that the new price system strongly reduced cost of transport final production from the factories to their consumer centers.

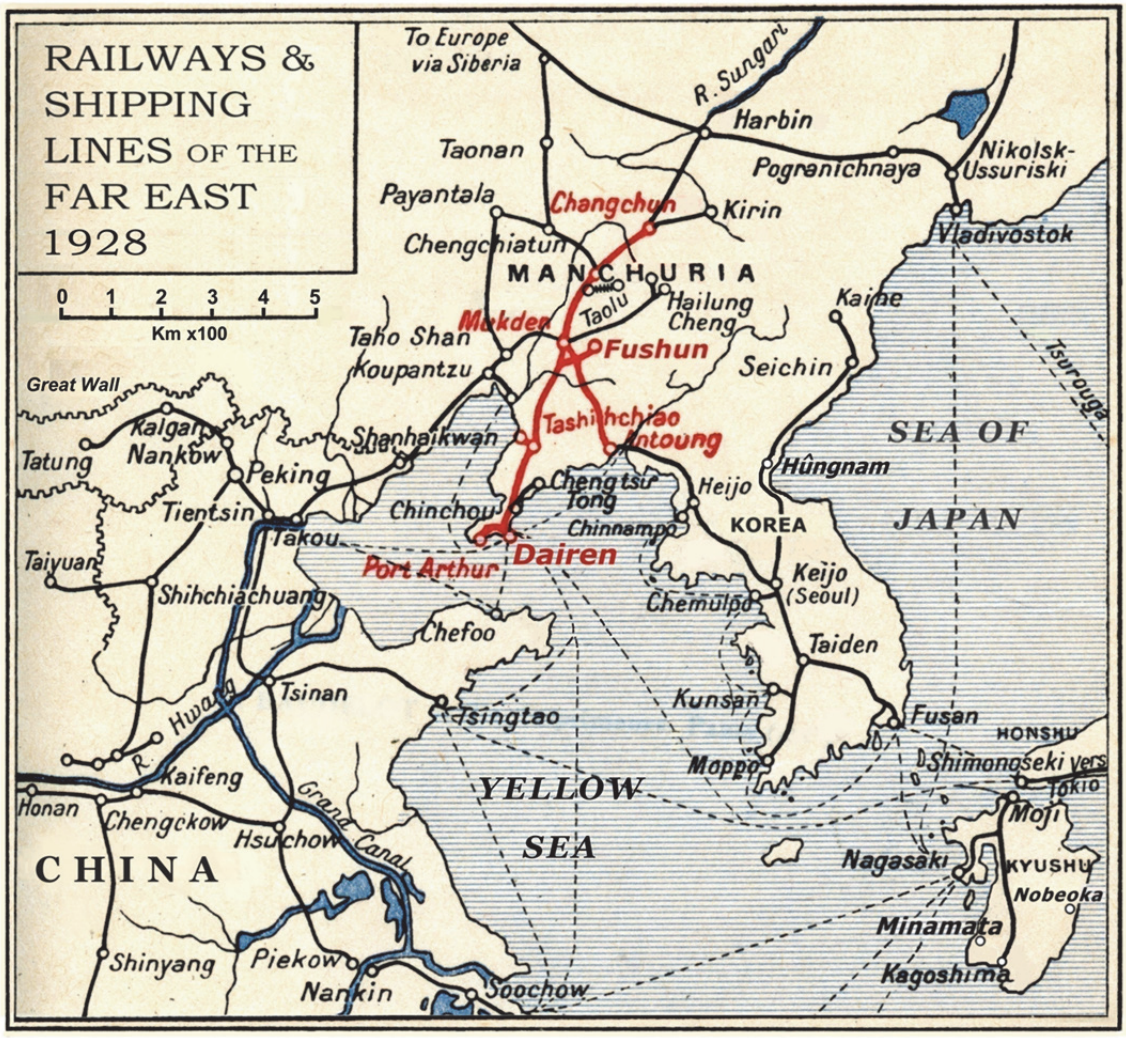
We will first start with the study of steel. As we have previously explained most of it was produced in Anshan and a little bit in Shenyang, in other words, both in the south of the region, while half of this steel was devoted to railway construction, which between 1931-1945 was mainly directed towards Eastern (Vladivostok frontier) and Northern Manchuria (USSR) and to Jehol (Ginsburg, 1949). Looking at map 4 we can see how distance was large so the new price system extraordinarily benefited transport towards those places, in which Japan was fighting the Soviets.

Then, a study of final uses of chemical products in Manchuria evidences that a big part of them were employed as fertilizers in Manchuria southern fields and central plain. We can see that distance was not big enough for this transport to profit from the new pricing system and it was even lower for transporting materials from chemical plants in Shenyang towards Mukden Arsenal plant which was the leading explosives producer in Manchuria. Nevertheless, the final destination for explosives and munitions which also were among the most relevant uses of chemicals production, was once again the frontier with the USSR in the North and Northeast, so the Kwantung promoted pricing system remarkably favored the mobilization of war materials towards the battlefront in the Armur River, Changfuken and Nomonhan.

Last but not least, the Kwantung Army's plans for industrialization counted with Japanese machinery as the main source of technology. This machinery was at first exported by boat to Dalian, close to the main Manchurian industrial centers. However, the war with China and confrontation with the Soviets generated an oil shortage in Japan which had to expand railway routes for reaching Manchuria (Harada, 1993). This idea would substitute Dairen from Fusan as the main commercial connection between

Japan and Manchuria but would generate additional railway costs because of the substantial increment in mileage generated by using the Fusan-Antung line in Korea and then the Antung-Dalian line to reach the principal industrial centers. In this regard, the new pricing system of the Kwantung Army aimed at facilitating transport of machinery from Japan to Southern Manchuria in order to foster industrial development because Korea lines were also administered by the SMR Co.

Map 4: Japan-Manchuria Railway Connections 1928.



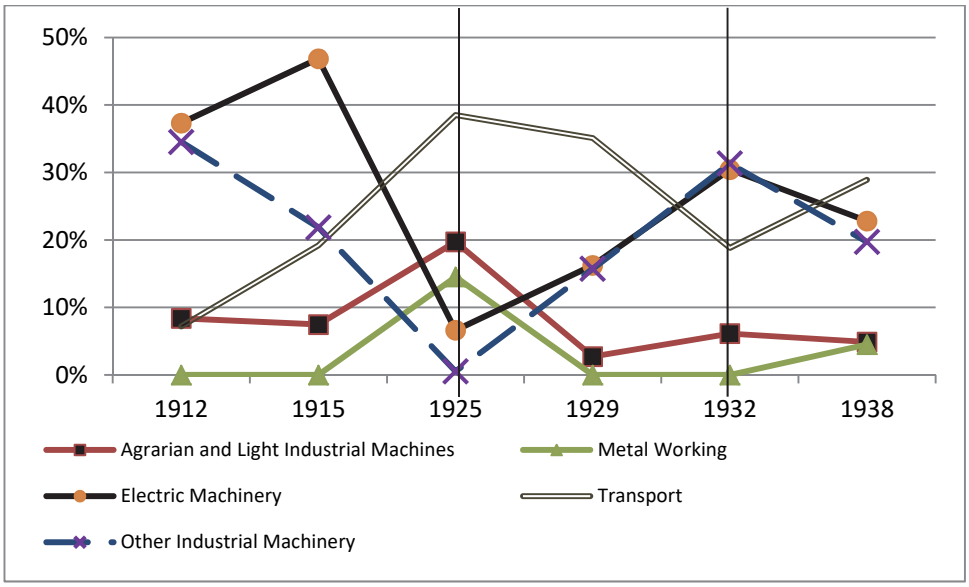
Source: Travis(2018)

Chapter 4 explains that machinery was the main item exported by the Japanese to its colony in Manchuria, especially after 1932. Nevertheless, we believe that a further discussion regarding the role of this machinery in Manchuria planned industrialization is necessary. Nevertheless, machinery sector is a wide one, so for a more detailed analysis of the evolution of machinery exports across Japan's colonization strategies

we've divided this sector into different sub sections using the Standard International Trade Classification (SITC).

Results are reflected on figure C.1 in which we can see how during most of the first stage (1912-1925) the share of light industrial machinery exports (manly spinning and weaving machines) rose, probably with the objective of supplying Japanese textile companies installed at Manchuria during early colonization years. At the same time, the share of electric and other industrial machinery exports decreased. We can also appreciate the relevance of transport equipment exports, showing that those materials were equally relevant on both the business and on the military stages. In this last stage we can see how between 1932-38 the share of electric and light industrial machinery decreased and only transport equipment and metal working machinery exports rose, reflecting military interests on heavy industrial development.

Figure C.1: Share of different components over total Japanese Machinery exports to Manchuria (1912-1938).

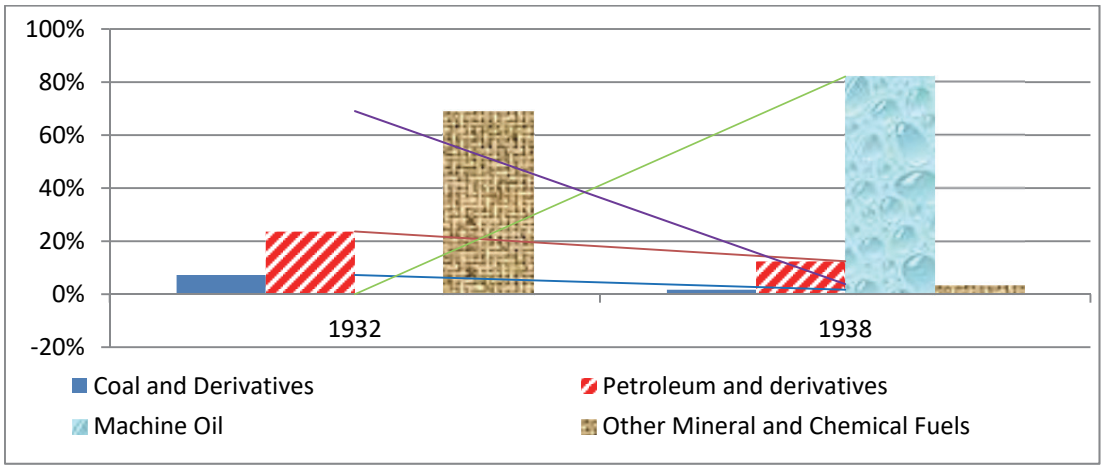


Source: See text

Furthermore, our work provides additional evidence on the relevance of Japanese machinery exports during Manchurian military stage. We can appreciate that apart from machinery, there are other two sectors benefiting remarkably from Kwantung Army's industrialization strategy and we demonstrate that those sectors were in fact complementing machinery exports. It is the case of fuels and raw materials which present bigger coefficients than machinery when we add controls to our regression. Complementarity between exports on the former example and machinery

ones seems pretty obvious as we can appreciate on figure C.2. There we can see how among fuel exports, those that experienced a biggest increment were machinery oil which acted as lubricant for machines exported by Japan in order to support military based industrialization of Manchuria.

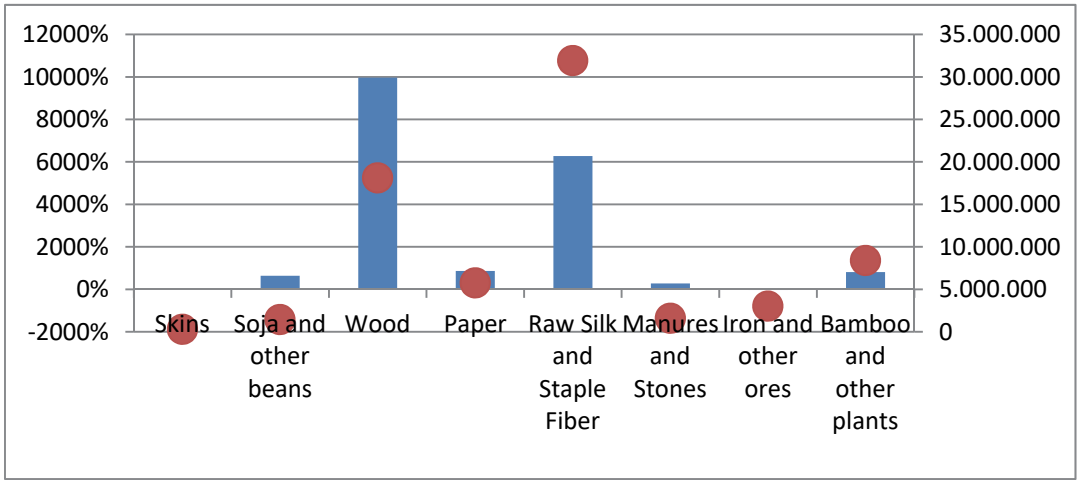
Figure C.2: Evolution of the share of coal, petroleum and machinery oil over total Japan's fuel exports to Manchuria (1932-1938).



Sources: See text.

In the case of raw materials exports we can also appreciate how they are closely related with Japanese transport equipment exports since the commodities experiencing a biggest increment on exports (and their total amount ranked second just behind staple fibers) were wood and derivatives, mainly destined to railway construction on the Soviet frontier.

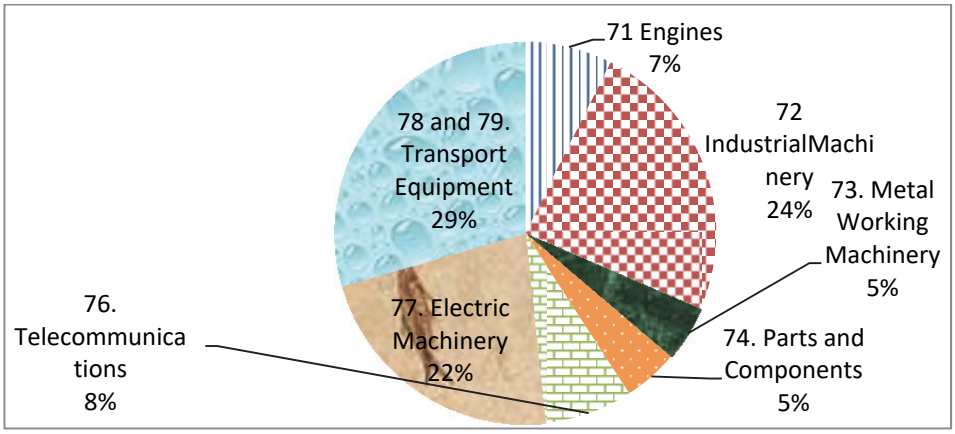
Figure C.3: % Increase in Japan's Raw Materials exports to Manchuria by component 1932-38 (left axis) and total exports in 1938 (right axis).



Sources: See text.

In order to finish this discussion, it is important to determine which Japanese companies were the main exporters of machinery, in order to discover which ones benefited the most from military occupation of Manchuria. As can be appreciated on the results section, Japanese machinery exports were relevant throughout all the colonization process, complementing business investments at first and helping military interests lately. Anyway, the focus of this analysis is the period 1932-38 in which we can see that the drivers of raising exports were electric machinery, railway and transport equipment and industrial machinery & tools.

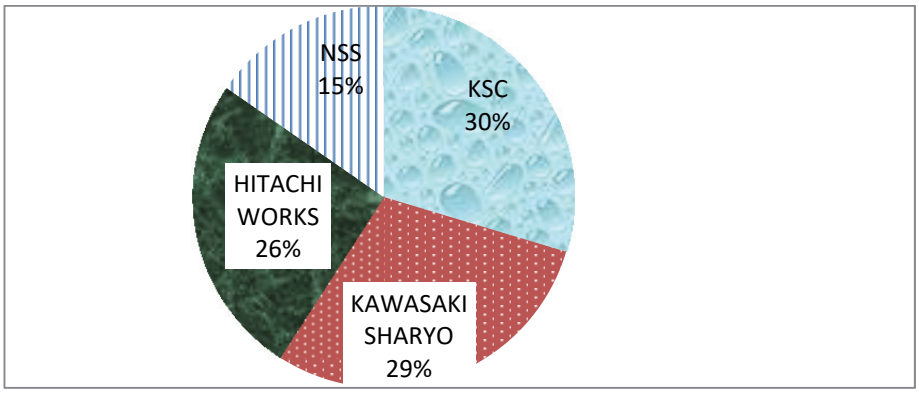
Figure C.4: Sector Distribution of the raise in Japanese Machinery exports to Manchuria (1932-1938).



Source: (Annual Returns of trade of the Empire of Japan 1932, 1938)

First of all, the main character of raising machinery exports were those products associated with Manchurian Railway expansion like transport equipment. At first, SMR locomotives and rolling stock were imported from the United States, although in the 1920s they started to become produced by the SMR workshop in Manchuria. Finally, railway expansion promoted by the Kwantung Army in the 1930s was sustained in Japanese locomotives and rolling stock exports. In that sense, as shown in figure C.5 Japanese producers formed a cartel in which the main companies were Kisa Seizo (Sumitomo and Nissan had investments there), Kawasaki Sharyo (Controlled by Kawasaki Heavy Industries), Hitachi works (Nissan) and Nippon Sharyo Seizo (6% owned by Sumitomo).

Figure C.5: Distribution of the raise in Japanese Machinery exports to Manchuria (1932-1938).



Source: Sawai (2017)

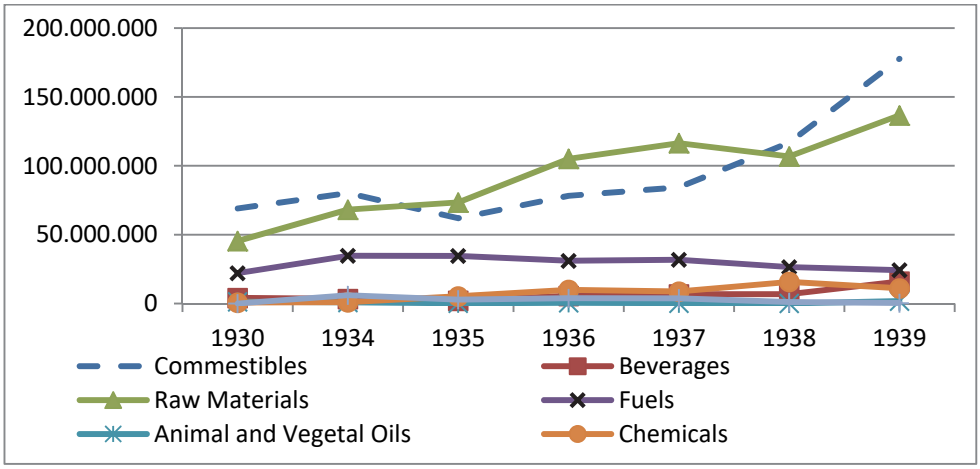
Regarding industrial machinery and tools the top five firms were Ikegai Co.(2.35% owned by Sumitomo), Okuma Machinery Works, Karatsu Iron Works Co., Niigata Engineering Co. (owned by Yasuda 1.22% and Nisso 2.56%) and Tokyo Gas Electric Engineering Co (owned by Mitsubishi 2.6%) (Kim, 2017).

The sector of electric machinery in Japan is led by Hitachi Ltd. which in 1940 was owned by a 40% by Nissan. In other words, once again Nissan is the main beneficiary of SMR prices controls. Nevertheless, electric machinery production in Japan was more diversified, so there were other big winners of Japanese colonization of Manchuria. For example Toshiba, which ranked second in the sector, was 8% owned by Mitsui Zaibatsu, whereas Mitsubishi Electric and Fuji Electric were almost entirely owned by Mitsubishi and Furukawa Zaibatsu respectively (United States, 1946). This sector lost its relevance in favor of transport equipment and metal working machinery, but it was still one of the main sectors among Japanese machinery exports to Manchuria so its business composition had to be studied.

In another vein, chapter 4 suggests that apart from industrial companies, analyzed reductions in railway transport costs could also favor trading firms devoted to export goods from Manchuria to Japan like Mitsui which was the main beneficiary of State-SMR exchanges during the first colonization stage. In that sense, the exporting sectors profiting the most from Kwantung Army policies were comestibles and raw materials as found on figure C.6. Inside them, the main commodities exported were soya beans and bean cakes traditionally extracted and transported by Mitsui through its collaboration with SMR Co. and Japanese Government (Sakamoto, 1990).

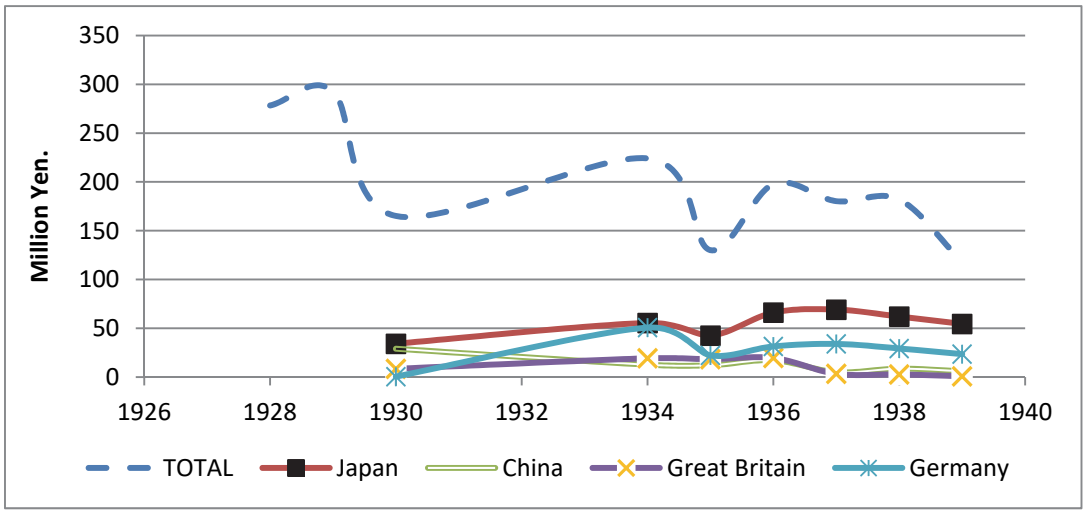
Nevertheless Mitsui gains were quite small in comparison with industrial companies, since exports of both commodities multiplied by 3 during the decade of military control whereas production of chemicals and iron multiplied by more than 50. Furthermore, if we discount inflation we can appreciate in figure C.7 that soya bean exports, decreased in real terms. This reduction is another sign of the military preeminence over market factors in Manchurian economic design at that time, since the staple in which this territory was the leading exporter became abandoned. The main reason for this stagnation is found on the lose by Manchuria of its principal buyers of soya bean like China and the British Empire, which couldn't be compensated by raises experimented by exports to its new master Japan and an ally like Germany. Of course, the Great Depression and its subsequent reduction of international demand for this commodity influenced these figures, but the most decisive factors behind the decay of soya bean exports were the international repulse experienced by Manchuria during Japanese imperial expansion and the inflation entailed on the implementation of the Five Years Industrial Plans (Mizuno & Prodöhl, 2019). In other words, although military intervention slightly rose exports of soya beans and bean cakes to Japan, it damaged Mitsui Zaibatsu in particular and the whole sector in general since they lost their main markets outside the Empire.

Figure C.6: Japanese Imports from Manchuria by sector (1930-1939)



Source: The Manchuria Yearbook (various volumes).

Figure C.7: Manchurian Soya Bean exports by country partner in 1933-34 million Yen.



Source: The Manchuria Yearbook various volumes.

Finally, the previous study of Manchurian exports to Japan reveals that the huge rises in iron and steel and chemicals production by Japanese companies in Manchuria were not sufficient to generate substantial raises in exports to Japan. A possible reason for that is the failure in attaining production targets set by Five Year Plans which aimed first at reaching Manchuria self-sufficiency and then to generate surplus for export to the homeland (Miwa, 2015,pp303-304).

Pig iron for example was probably the main exception to this tendency. It was exported as a raw material to the homeland before 1935, although produced quantities were modest. Those exports were sharply reduced after the establishment of Five Year Plans in Manchuria and the transfer of pig iron to supply local steel producers like Showa Steel Works, although they return to be relevant after 1941. Even at that time internal consumption (60%) was superior to exports to Japan (40%) (Rodgers, 1948). This presumably relevant amount of exports is however not reflected on figure C.6 which only reaches 1939.

The case of Manchurian steel production on the other hand follows the general tendency appreciated on the mentioned graph: production increments only permitted to develop Manchurian industry since the vast majority was employed for internal purposes (between 82 and 96% during 1942-44) and was almost exhausted with railway construction and the development of important industries (United States Strategic Bombing Survey, 1946).

Finally, something similar occurred to Japanese chemical production inside Manchuria which was also mainly destined to internal consumption because the excess supply objective that would permit massive exports to Japan was never achieved. The most relevant chemicals produced were sulfate of ammonium and sulfuric acid which were employed as fertilizers (Deasy, 1940). Production of explosives was also relevant on the second half of the 1930s and it was devoted to mining, construction and military purposes. In that sense Manchurian munitions producers (Manchurian Explosives Co. and Mukden Arsenal) were partially owned by the Japanese Army and Government so they could be directly translated to the battlefield without having to be exported to Japan.

C.3. Econometric concerns.

On section 6 of chapter 4 we've presented results of regressing SMR real freights on production by Japanese companies inside Manchuria and Japanese exports to Manchuria by sector and explained that they confirm our main hypothesis. However, the interpretation of these results is not straightforward and the present section is going to show a different method for displaying results that will help us to better understand the different impacts of the independent variable across sectors.

First of all we should notice that we are dealing with interactions across sectors. In other words, changes on railway prices are not affecting every sector's production in the same way because we should add each sector's specific interaction to the overall coefficient presented by the independent variable. On the thesis' main body we saw that during 1931-1941 reductions on railway freights were correlated with increments in production across each sector as it is suggested by the negative coefficient presented by the independent variable. We argued that the impact of railway transport costs on production was however smaller at sectors presenting positive and significant coefficients and relatively bigger at those displaying insignificant coefficients which were chemicals, basic metals and paper manufactures.

Nevertheless, this interpretation is subject to some econometric concerns. For example one could interpret that insignificant coefficients in the interaction term should be treated as if the sector specific impact is zero and the effect of the independent variable on this sector's production is equal to the overall effect. This interpretation would mean that a 1% reduction on SMR real freights would generate an equal increment of 3.986% of chemicals, metals and paper production. Of course this impact

is bigger than the one presented by the rest of the sectors, thus confirming our main hypothesis. Notwithstanding, the fact that a coefficient is insignificant doesn't imply that its effect is zero but that there is no evidence rejecting the null hypothesis that this effect is zero. This could happen because the obtained coefficient is quite close to zero, the standard error is quite big or a combination of both.

All in all, this econometric caveat doesn't permit us to interpret insignificant coefficient as if they were zero. For that reason, this section will display the overall impact that reductions of SMR freights had at every sector's production by adding the general coefficient to interaction ones, no matter if those coefficients are significant or not.

Table C.1: Sector specific impact of SMR freights on production by Japanese companies in Manchuria (1931-1941).

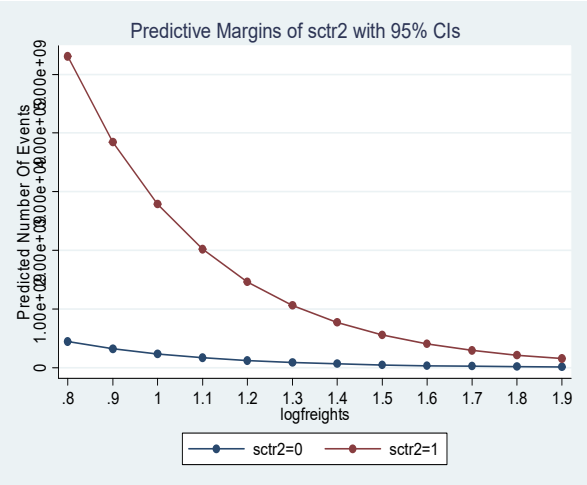
EFFECTS FREIGHTS ON PRODUCTION BY SECTOR	No Controls	Controls
Ceramics	-3.066	-2.191
Chemicals	**-3.9719**	**-3**
Comestible	-2.516	-1.559
Machinery	-2.74	-1.778
Metal	**-3.9563**	**-2.584**
Paper	-3.37	-2.533
Wood	-2.557	-2.504
Textiles	-2.951	-2.11

In the end, this new way of presenting results still confirms our main hypothesis. If we don't add additional controls to our regression, chemicals and basic metals are by far the sectors whose production was most sensitive to changes on SMR freights. This conclusion is also reached if we add controls to the regression, although in this case the impact found on sectors like wood or paper is closer to the one of basic metals. Anyway, the superior sensitivity of chemicals and basic metals to military policies is definitely confirmed by the analysis of margins. As we can observe in figure C.8, raises on SMR freights generated important decreases of production in basic metals and chemicals (in red), while it didn't almost reduce average production on the rest of the sectors (in blue). This however didn't happen for paper manufactures in which raises on tariffs reduced production on a lower extent than on the rest of sectors. In fact, this pattern was repeated on the rest of sectors that presented lower sensitivity to SMR

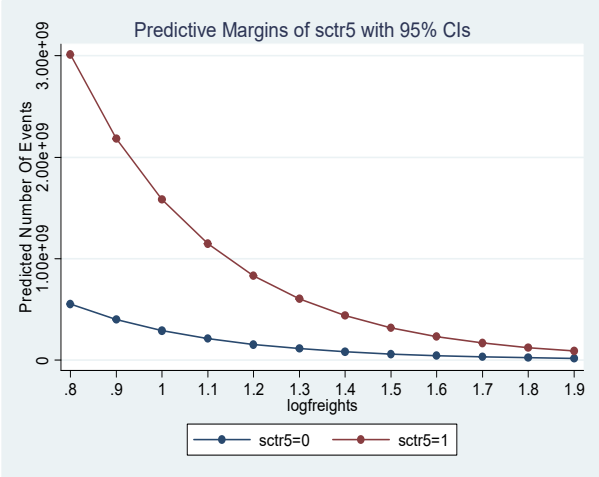
transport fares. In other words, analysis of margins show that basic metals and chemicals were more sensitive than average to changes on SMR freights, whereas paper wasn't.

Figure C.8: Margins plot for production in Chemicals, Basic Metals and Paper Manufacturing.

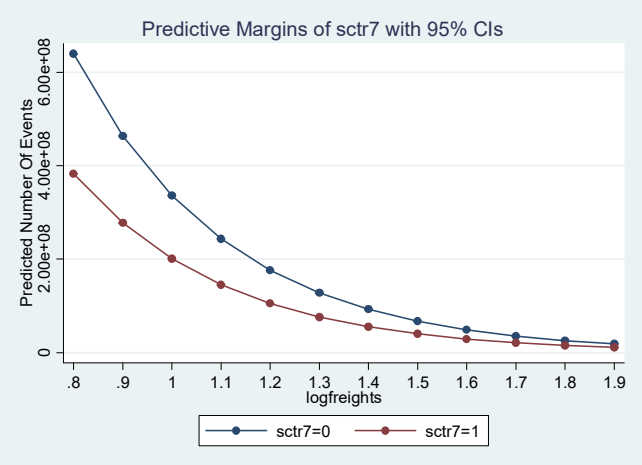
Chemicals



Basic Metals



Paper



This new results display also confirms our hypothesis that machinery exports from Japan were the main beneficiaries of reductions on SMR freights imposed by the Kwantung Army. Increments on tariffs during the first stage were related with an overall raise of Japanese exports to Manchuria, which was much bigger on machinery and comestibles (and also on vegetal oil once we add controls). On the other hand, during the second stage SMR freights were artificially set down and that's why most sectors present negative coefficients for 1932-1938 periods, pointing to an overall increment in Japanese exports. This overall increase on exports during 1932-38 was much bigger on machinery exports and it was still among the most sensitive sectors

once we add controls. In other words, machinery exports were the most benefited during both colonization stages, showing an interest of using Japanese machinery for sustaining Manchurian industrialization.

Table C.2: Sector specific impact of SMR freights in Japanese exports to Manchuria by sector (1912-1938).

EFFECTS FREIGHTS ON EXPORTS BY SECTOR	1912-29 No Controls	1912-29 Controls	1932-38 No controls	1932-38 Controls
Comestible	7.756	7.917	-3.206	9.495
Beverages	3.653	-0.385	-2.036	-2.67
Crude Materials	2.989	-2.469	-6.186	-5.26
Fuels	4.170	-3.509	-2.546	-3.18
Vegetal Oil	3.939	12.605	-4.306	9.023
Chemicals	6.036	4.009	-6.006	1.5
Unfinished Manufactures	4.954	0.836	-5.656	0.36
Machinery	**9.1674**	**9.39**	**-8.276**	**-1.66**
Finished Manufactures	3.917	-3.079	-4.276	9.751

In the end, the two main conclusions extracted from this table are, on the one hand, that the overall effects of railway transport prices over Japanese exports to Manchuria were rather different across the two stages. In order to confirm this we perform a Wald test of equality of coefficients. There we can see how coefficients on Alfa (stage 1) and beta (stage 2) regressions are statistically different. The second result is that machinery exports were the most benefited from military control over railway transport fares, although their superiority vanishes after adding controls. Nevertheless, the performance of a Wald test is showing that the coefficient of the interaction between SMR freights and machinery exports in the second stage is the same with and without adding controls, which supports the idea that those kinds of exports were the most benefited by the military plans on Manchuria.

Table C.3: Wald Test of equality of coefficients 1912-1929 vs. 1932-1938 regressions.

```
. test[alfa_mean==beta_mean]

 ( 1)  [alfa_mean]logfreight - [beta_mean]logfreight = 0
 ( 2)  [alfa_mean]COMMESTIBLES - [beta_mean]COMMESTIBLES = 0
 ( 3)  [alfa_mean]BEVERAGESANDTOBBACCO - [beta_mean]BEVERAGESANDTOBBACCO = 0
 ( 4)  [alfa_mean]CRUDEMATERIALSNONCOMESTIBLESE - [beta_mean]CRUDEMATERIALSNONCOMESTIBLESE = 0
 ( 5)  [alfa_mean]FUELSANDMINERALLUBRICANTS - [beta_mean]FUELSANDMINERALLUBRICANTS = 0
 ( 6)  [alfa_mean]ANIMALAANDVEGETALOILSANDFATS - [beta_mean]ANIMALAANDVEGETALOILSANDFATS = 0
 ( 7)  [alfa_mean]CHEMICALS - [beta_mean]CHEMICALS = 0
 ( 8)  [alfa_mean]UNFINISHEDMANUFACTURES - [beta_mean]UNFINISHEDMANUFACTURES = 0
 ( 9)  [alfa_mean]MACHINERYANDTRANSPORTEQUIPMENT - [beta_mean]MACHINERYANDTRANSPORTEQUIPMENT = 0
 (10)  [alfa_mean]FINISHEDMANUFACTURES - [beta_mean]FINISHEDMANUFACTURES = 0
 (11)  [alfa_mean]freightcommestible - [beta_mean]freightcommestible = 0
 (12)  [alfa_mean]freightbeverages - [beta_mean]freightbeverages = 0
 (13)  [alfa_mean]freightcrudematerials - [beta_mean]freightcrudematerials = 0
 (14)  [alfa_mean]freightfuels - [beta_mean]freightfuels = 0
 (15)  [alfa_mean]freightvegetaloil - [beta_mean]freightvegetaloil = 0
 (16)  [alfa_mean]freightchemicals - [beta_mean]freightchemicals = 0
 (17)  [alfa_mean]freightunfinished - [beta_mean]freightunfinished = 0
 (18)  [alfa_mean]freightmachinery - [beta_mean]freightmachinery = 0
 (19)  [alfa_mean]freightfinished - [beta_mean]freightfinished = 0

           chi2( 19) =  256.23
         Prob > chi2 =    0.0000
```

Table C.4: Wald Test of equality of coefficients: Machinery exports with and without controls (1932-38).

```
. test [logexports=2logexports]:freightmachinery

 ( 1)  [logexports]freightmachinery - [2logexports]freightmachinery = 0

           chi2(  1) =    2.07
         Prob > chi2 =    0.1504
```

For the case of robustness checks we've decided to also display results by adding each sector specific coefficient to the independent variable. First of all, we can appreciate how after changing the explanatory variable for trying to capture railway freights on a kilometer base, chemicals and metals production is still the most sensitive to reduction in railway tariffs. A 1 % reduction in railway freights per ton and kilometer is associated with an increment of 1.5% in production of both sectors when no additional controls are added. The effect is much lower when we add control variables (0.758% increase on chemicals production and 0,618% for basic metals) but is still higher than the one presented by the rest of the sectors with the exception of wood.

Table C.5: Sector specific impact of SMR freights in Japanese exports to Manchuria by sector (1912-1938).

EFFECTS FREIGHTS per KM ON PRODUCTION BY SECTOR	No Controls	Controls
Ceramics	-0.947	-0.317
Chemicals	**-1.5611**	**-0.758**
Comestible	-0.72	0.051
Machinery	-0.794	-0.252
Metal	**-1.5222**	**-0.618**
Paper	-1.09	-0.461
Wood	-0.729	-0.858
Textiles	-0.945	-0.304

Furthermore, results under this new variable still show the two differentiated colonization strategies practiced by the Japanese in Manchuria. On the first one SMR freights per kilometer were associated to Manchuria's prosperity and that's why increments on freights were associated with increases on exports, being machinery (and vegetal oil once we add controls) the most sensitive sectors to changes on railway tariffs. During the second stage we still appreciate how the forced reduction on railway freights per kilometer was associated with increments on exports, especially relevant on machinery sector.

Table C.6: Sector specific impact of SMR freights per Kilometer in Japanese exports to Manchuria by sector (1912-1938).

EFFECTS FREIGHTS per KM ON EXPORTS BY SECTOR	1912-29 No Controls	1912-29 Controls	1932-38 No controls	1932-38 Controls
Comestible	7.515	7.5571	-0.4633	-0.098
Beverages	3.569	-0.478	-0.2933	-2.577
Crude Materials	2.91	-2.696	-0.8913	-2.229
Fuels	4.029	-3.546	-0.3673	-1.415
Vegetal Oil	3.865	11.921	-0.6203	0.061
Chemicals	5.845	3.735	-0.8663	-1.702
Unfinished Manufactures	4.796	0.871	-0.8163	-2.069
Machinery	**8.864**	**8.889**	**-1.1943**	**-1.224**
Finished Manufactures	3.8	-3.266	-0.6163	1.346

Finally and, as explained on chapter 4, conclusions reached using SMR real freights as the explanatory variable are the same as when we get rid of reverse causality employing Five Years Plan dummy as variable; Chemicals and pas were the sector whose production experienced a biggest jump related with planned industrialization. For example, production in chemicals after the Five Year Plan was launched rose by 7765% with respect to previous production.

Table C.7: Sector specific impact of Five Year Plans on production by Japanese companies in Manchuria (1931-1941).

EFFECTS FIVE YEARS PLAN ON PRODUCTION BY SECTOR	No Controls	Controls
Ceramics	3.181	5.147
Chemicals	**4.365**	**6.562**
Comestible	2.926	5.13
Machinery	2.966	4.746
Metal	**4.084**	**6.052**
Paper	3.444	5.371
Wood	2.927	4.46
Textiles	3.26	5.335

Regarding exports we can also see that the overall effect of Kwantung Army's economic plans was highest on machinery exports if we don't include controls and it was also among the highest one along with complementary sectors once we add them.

Table C.8: **Sector specific impact of Five Year Plans in Japanese exports to Manchuria by sector (1912-1938).**

EFFECTS FIVE YEAR PLANS ON EXPORTS BY SECTOR	No Controls	Controls
Comestible	15.686	19.327
Beverages	15.27	20.866
Crude Materials	16.912	22.676
Fuels	15.926	22.754
Vegetal Oil	16.258	20.918
Chemicals	16.441	19.075
Unfinished Manufactures	15.869	20.925
Machinery	**17.181**	**22.44**
Finished Manufactures	15.567	20.308